21/989

U.S. Department
of Transportation
**Federal Aviation
Administration**

Federal Aviation Regulations

Part 21
Certification Procedures for Products and Parts

Published
May 1974

Consolidated Reprint
This consolidated reprint
incorporates:
Changes 1 through 31
as of 12/22/88 & 1/3/89

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PART 21

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Introductory Note

Part 21 is codified under Subchapter C, Aircraft, of Title 14 of the Code of Federal Regulations.

This FAA publication of the basic Part 21, effective February 1, 1965, incorporates Amendments 21-1 through 21-39 and any changes required by the Department of Transportation transition amendment.

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Adoption of Part 21

Adopted: October 14, 1964 **Effective: February 1, 1965**

(Published in 29 F.R. 14562, October 24, 1964)

This amendment adds Part 21 [New] to the Federal Aviation Regulations to replace the procedural rules governing the certification of products and parts as presently set forth in Parts 1, 3, 4b, 5, 6, 7, 8, 9, 9a, 10, 13, 14, and 410 and in Special Civil Air Regulations 422B and 425C. This amendment is part of the recodification program announced in Draft Release 61-25 published in the Federal Register on November 15, 1961 (26 F.R. 10698).

Part 21 [New] was published as a notice of proposed rule making in the Federal Register on May 27, 1964 (29 F.R. 6999), and given further distribution as Notice No. 64-31.

Many of the comments received recommended specific substantive changes to the regulations. Although many of the recommendations appear to be meritorious, they cannot be adopted as a Part of the recodification program. The purpose of the program is simply to streamline and clarify present regulatory language and delete obsolete or redundant provisions. To attempt substantive changes, other than relaxatory ones that are completely noncontroversial, would delay the project and be contrary to the ground rules specified for it in Draft Release 61-25. However, all substantive comments received will be retained and will be given careful consideration in future regulatory projects.

As was stated in the preamble of the notice of proposed rule making of Part 21 [New], those definitions in present Part 1 (and not now in Part 1 [New] or executed in this Part) that are necessary, will be recodified with the definitions of other airworthiness Parts and added to Part 1 [New].

One of the comments received questioned the omission as surplusage of the .12 and .18 sections of CAR Parts 3, 4b, 5, 6, 7, 13, and 14 in the notice of proposed rule making. The .12 sections contained a direction to the Administrator to record in the type certificate the applicable regulations with which an applicant has shown compliance. This direction to the Administrator was a vestige of rules promulgated by the Civil Aeronautics Board and directed to the Administrator of the Civil Aeronautics Administration. Because of the consolidation of rule making authority in the Federal Aviation Agency, they are no longer necessary in the Federal Aviation Regulations. Section 21.41 indicates clearly that the type certificate is considered to include "the applicable regulations of this subchapter with which the Administrator records compliance".

The .18 sections generally related to the approval of materials, parts, processes, and appliances "upon a basis and in a manner found necessary by the Administrator to implement the pertinent provisions of the regulations in this subchapter". Paragraph (a) of this section also is no longer necessary for the reason set forth in the preceding paragraph. Paragraph [illegible] is covered by § 37.1 of Part 37 "Technical Standard Order Authorizations" [New]. However, the note to the .18 sections is being retained as § 21.305 so that it is clear that there are three possible ways in which a material, part, process, or appliance may satisfy "approval" requirements.

A new § 21.307 has been added to reflect CAR §§ 10.21 and 10.31. Those sections provided for the approval of materials, parts, and appliances manufactured in a foreign country upon certification by that country that the material, part, or appliance conforms to the applicable specifications adopted by the Administrator.

The distribution table for the notice indicated that CAR § 1.74(b) would be transferred to Part 91 [New]. This paragraph was another direction to the Administrator of the Civil Aeronautics Administration by the Civil Aeronautics Board and is no longer necessary for the reasons stated previously. The prohibition against carrying passengers for compensation or hire in experimentally certificated aircraft is an operating limitation issued by the Agency and the omission of this provision does not result in any substantive change since, under § 91.31, no person may operate an aircraft contrary to its operating limitations.

The provisions of CAM § 1.77–4 have been transferred to Part 91 [New] rather than to the air carrier operating rules, as indicated in the notice, since operations under these provisions are not in air transportation.

The definition of "product" in § 21.1(e) has been broadened to include "propellers" as did the definition of that term in CAR Part 1. In addition, the term "appliances" has been deleted from this definition since the CAR Part 1 definition included only "appliances . . . eligible for a type certificate". No appliances are presently eligible for a type certificate.

The provisions relating to "production under a type certificate only" that were contained in §§ 21.53(a) and 21.55 through 21.65 of the notice have been transferred from Subpart B to a separate Subpart F. These sections do not relate to the issue of a type certificate and it is more appropriate that they be in a separate subpart immediately preceding the subpart on "production certificates".

Proposed § 21.63 (§ 21.128) has been rewritten to reflect the accepted interpretation of present CAM § 1.15–4(e) throughout the Agency and the industry. This change conforms to the existing practice of defining the production acceptance test in terms of the maximum continuous rating and the takeoff rating.

Section 21.181 has been rewritten to make it clear that an airworthiness certificate for a particular aircraft is effective only as long as the aircraft is registered in the United States. This change is not substantive, but merely clarifying in nature, since it is a statement of existing law under the Federal Aviation Act.

Section 21.189 has been rewritten to include the statement presently contained in CAR §§ 1.71 and 9.3 indicating that after June 30, 1965, no limited category airworthiness certificates will be issued unless the aircraft was previously issued an airworthiness certificate in that category. In addition, the prohibition against operating a limited category aircraft carrying persons for compensation or hire has been transferred from § 21.189 to § 91.40 since it is more appropriate in Part 91.

Section 21.197(a)(1) has been rewritten to include the performance of "maintenance" as one of the purposes for which a special flight permit may be issued. Since special flight permits have traditionally been issued for the purpose of performing maintenance and since any change that is being made is relaxatory this may be done as part of the recodification project.

Sections 21.15 and 21.47 have been changed to reflect the amendment proposed in Notice 64–7 issued February 5, 1964 (29 F.R. 2349). As amended, § 21.15 states that an application for a type certificate should be submitted to the appropriate FAA regional office. Section 21.47 incorporates the proposed amendment to CAR § 1.14 requiring the grantor of a type certificate to notify the appropriate FAA regional office within 30 days after the transaction, specifying the date of transfer, and requiring a similar notice after the termination of a licensing agreement. The Agency did not receive any adverse comments to Notice No. 64–7 and therefore these amendments are incorporated in Part 21 [New].

Section 21.77 has been amended to change the duration of a Class II provisional type certificate from "six months after the date of issue, or 60 days after the corresponding type certificate is issued whichever is first" to "twelve months after the date of issue". Section 21.77 is based on § 4 of Special Civil Air Regulation 425C. The Agency has found that in many cases the 60-day period after the issue of the type certificate is inadequate for an aircraft manufacturer to effect modifications of the provisionally certificated aircraft for conformance with the type design. By extending the duration period to twelve months the Agency believes that adequate time will be provided for any modifications necessary to conform to the type design. Since this amendment is noncontroversial and imposes no additional burden on any person it may be made without compliance with the notice and public procedure provisions of the Administrative Procedure Act.

As the preamble to Part 31 [New] stated, (29 F.R. 8256) Subpart G—"Certification Procedures" of that Part is deleted since the provisions of Part 21 [New] are applicable to manned free balloons.

Other minor changes of a technical nature have been made. They are not substantive and do not impose any burden on regulated persons.

This amendment deletes CAR Parts 1, 5, 8, 9, 9a, 10, 13, 14, and 410 and certain sections of SR 425C. The procedural requirements of Parts 3, 4b, 6, and 7 will be deleted by the separate amendments recodifying the airworthiness requirements of those Parts. Those amendments will be made effective on the same date as this amendment.

Interested persons have been afforded an opportunity to participate in the making of this regulation, and due consideration has been given to all relevant matter presented. The Agency wishes to thank those persons who submitted comments for the cooperative spirit in which those comments were submitted.

In consideration of the foregoing Chapters I and III of Title 14 of the Code of Federal Regulations are amended as hereinafter set forth effective February 1, 1965.

A Part 21 [New] reading as follows is added.

This amendment is made under the authority of §§ 311, 313(a), 314, 601, 603, 607, 608, 609, and 1102 of the Federal Aviation Act of 1958 (49 U.S.C. 1352, 1354(a), 1355, 1421, 1423, 1427, 1428, 1429, and 1502).

Amendment 21-1

Effectiveness of Airworthiness Certificates

Adopted: June 17, 1965 **Effective: September 21, 1965**

(Published in 30 F.R. 8032, June 23, 1965)

The purpose of this amendment is to clarify the regulation governing the duration of airworthiness certificates with respect to the performance of alterations. In addition, the details of the revision to the format of airworthiness certificates as specified in the Notice on this matter are set forth herein. This action is based on the proposal published in the Federal Register (27 F.R. 12720) and issued as Draft Release 62-55.

While Draft Release 62-55 proposed to amend sections of Parts 1 and 43 of the Civil Air Regulations, these regulations have subsequently been recodified as Parts 21 and 91 respectively, of the Federal Aviation Regulations. These amendments are therefore made to the appropriate sections of the recodified parts.

As proposed in the Draft Release, § 21.181(a) (formerly § 1.64) is amended to make it clear that an airworthiness certificate remains in effect as long as alterations, as well as maintenance, are performed in accordance with Parts 43 and 91 of the Federal Aviation Regulations. In addition, § 91.163 (formerly § 43.20) is amended to include alterations within the prohibition provided therein. In connection with these amendments, there were comments suggesting that the regulations should make it clear that alterations must also be "accomplished in accordance with the pertinent portions of the applicable airworthiness requirements . . .". As amended, the regulations now require that alterations be accomplished in accordance with Part 43, which in turn requires that alterations be performed on the basis of approved technical data and that after alteration the aircraft, airframe, aircraft engine, propeller or appliance worked on must be at least equal to its original or properly altered condition. Thus, under the current provisions of Part 43 the applicable airworthiness requirements must be considered during the performance of alterations. For this reason, the Agency does not believe that a general reference to the applicable airworthiness requirement as suggested is necessary or would serve any useful purpose.

At the time that the Draft Release was issued, the term "maintenance" included preventive maintenance. However, as now defined, maintenance does not include preventive maintenance. Therefore to make these regulations consistent with the proposal, §§ 21.181(a) and 91.163 are amended to specifically include preventive maintenance.

In addition to the foregoing, the proposal would have amended the regulation governing the duration of airworthiness certificates to require that an aircraft be in a condition for safe operation in addition to requiring that maintenance and alterations on the aircraft be performed in accordance with Parts 43 and 91 of the Federal Aviation Regulations. However, since the requirement for the performance of maintenance and alterations in accordance with Parts 43 and 91 is designed to assure that the aircraft is in a condition for safe operation, the proposed amendment appears to be unnecessary and could be misleading. For these reasons, the regulation has not been changed as proposed.

Certain other clarifying changes proposed in Draft Release 62-55 have subsequently been incorporated into the regulations. In this connection, during the recodification program a clarification was incorporated into § 21.181(a) specifying that an airworthiness certificate is effective as long as the aircraft for which it is issued is registered in the United States. Moreover, § 91.27(a) was recently amended to provide the clarification concerning special flight permits which was proposed in Draft Release 62-55.

Draft Release 62-55 proposed that the regulations (formerly § 43.20) be amended to require that an aircraft be inspected and found to be in a condition for safe operation whenever the approved operating limitations for the aircraft had been exceeded. The comments received concerning this proposal pointed out the problems involved in establishing compliance with this requirement, indicating that it was unworkable and subject to many interpretations. On the other hand, as recodified, the regulations now expressly provide that the pilot in command is responsible for determining whether his aircraft is in condition for safe flight and require him to discontinue the flight when unairworthy mechanical or structural conditions occur. In view of the foregoing the proposed requirement is not being adopted.

The Draft Release referred to the Agency's plans to revise the format of airworthiness certificates. In this connection, as proposed, the new format will reflect the amendments set forth herein and will provide for the enumeration of any exceptions to full compliance with the applicable comprehensive and detailed national airworthiness requirements in accordance with the Convention on International Civil Aviation (ICAO). It was proposed to add an explanatory NOTE to the regulations to the effect that the airworthiness certificate would identify any exemptions from the applicable airworthiness requirements that had been granted for an aircraft. However, the Agency does not now consider that such a NOTE is necessary or appropriate. Moreover, it has subsequently been determined by the Agency that at this time the revised airworthiness certificate need only be issued for aircraft certificated in the normal, utility, acrobatic, and transport category. In addition, it should be emphasized that this amendment does not require the exchange of present certificates. Certificates in the new format will simply be issued in the future to persons applying for airworthiness certification.

There was also a general comment made with respect to the need for definitions of the terms "airworthy" and "airworthiness" in the regulations. While the Agency is aware of the problems referred to in this comment, the recommended action goes beyond the scope of the Notice in this matter.

Interested persons have been afforded an opportunity to participate in the making of this amendment and due consideration has been given to all relevant matters presented.

These amendments are issued under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421, 1423).

In consideration of the foregoing, Parts 21 and 91 of the Federal Aviation Regulations are amended effective September 21, 1965, as follows.

Amendment 21-2

Export Airworthiness Approval Procedures

Adopted: June 24, 1965 **Effective: August 30, 1965**

(Published in 30 F.R. 8464, July 2, 1965)

The purpose of this amendment is to prescribe the regulations and procedures applicable to the issuance of export certificates of airworthiness and other export airworthiness approvals. This action was published as a notice of proposed rule making and circulated as Federal Aviation Agency Notice No. 63-15 (28 F.R. 3728). It was proposed to amend Part 1 of the Civil Air Regulations. However, Part 1 has been recodified as Part 21 of the Federal Aviation Regulations and this rule is issued in its recodified form as an amendment to Part 21.

Section 1102 of the Federal Aviation Act of 1958 requires the Administrator to exercise and perform his powers and duties under the Act consistent with any obligation assumed by the United States in any treaty, convention, or agreement that may be in force between the United States and any foreign country or countries.

The United States has concluded reciprocal agreements with a number of foreign countries governing the import and export of aeronautical products. These agreements provide for the mutual validation or acceptance of export certificates of airworthiness issued for aeronautical products which are manufactured in and meet the airworthiness requirements of the country of export and any special requirements of the importing country.

The export airworthiness approval procedures set forth in the regulation implement the reciprocal agreements and, for the most part, are the same as the procedures previously published by the FAA in a Manual of Procedures. An export airworthiness approval issued by the FAA is not to be confused with nor does it take the place of an export license which is required and issued by the United States Department of Commerce or the United States Department of State. Furthermore, an export certificate of airworthiness is not an airworthiness certificate under the Act, and does not authorize the operation of aircraft for which it is issued.

Numerous comments have been received in response to the notice of proposed rule making and changes have been made in the regulation in the light of such comments. One of the comments received in response to Notice 63-15 questioned the need for the regulation, suggesting that an overhaul of the former Manual of Procedures would be adequate. The export airworthiness approval procedures set forth in this regulation, as well as in the former Manual of Procedures, are designed to implement the reciprocal agreements between the United States and various foreign countries. Therefore, compliance with such requirements is necessary in order to obtain an export airworthiness approval from the FAA. As indicated in the preamble to Notice 63-15, publication of this regulation is necessary in order to provide the public with the current requirements concerning export airworthiness approvals.

Another comment objected to the proposed inclusion of the special requirements of the various foreign countries in an Appendix to the regulation. It was stated that such inclusion would make the special requirements mandatory with respect to the aircraft manufacturers. The FAA has decided to set forth the special requirements of the foreign countries as well as other necessary information concerning this regulation in an Advisory Circular rather than an Appendix. However, it should be pointed out that the special requirements of the various foreign countries are a part of the reciprocal agreements between the United States and such foreign countries and as such are mandatory requirements for the issuance of airworthiness approvals by the FAA regardless of whether or not they are set forth in an Appendix.

A comment was also received which suggested that the Export Certificate of Airworthiness should constitute an airworthiness certificate so that the aircraft could be operated for training purposes and for the purpose of ferrying the aircraft. However, many of the aircraft for which an export certificate of airworthiness is requested are aircraft which have been sold to a foreign purchaser and the title to the aircraft has passed to such purchaser. Such aircraft are not eligible for U.S. airworthiness certificates and if the suggestion were incorporated into this regulation, these aircraft would not be eligible for Export Certificates of Airworthiness. This would defeat the purpose of the regulation.

There was an objection to the proposed time limit on the duration of Special Export Airworthiness Approvals on the grounds that 60 days does not allow sufficient time in which to complete most sales transactions. It was recommended that there be no time limit established for such approvals. Upon further consideration, the Agency agrees that a specific time limit should not be necessary in the light of the other provisions of this regulation and the 60-day time limit has been deleted with respect to Special Export Airworthiness Approvals.

This regulation requires an applicant for an export certificate of airworthiness for a Class I product to show that the product meets certain specified requirements. However, as proposed, one of the requirements specifically provided that the required showing be made at the time the application for the certificate is made. This was considered appropriate even though a showing of compliance with such requirement would obviously require that the product be submitted for examination by the Agency, because it was thought that the filing of the application and the presentation of the product for export approval would occur at the same time. However, the Agency is now aware that there may be instances involving a substantial period of time between the filing of the application and the presentation of the product for examination by the Agency. Therefore the proposal has been revised to make it clear that the required showing of compliance by the applicant for the export approval of a Class I product must, in all cases, be made at the time the product is submitted to the Administrator for such export approval.

With respect to the requirement that used engines and propellers must be newly overhauled in order to be covered by an FAA export approval, it was recommended that such products should be issued export approval without having to be newly overhauled if they were in a serviceable condition. The Agency sees some merit in this recommendation and the proposal has been relaxed with respect to used engines and propellers that are being exported as a part of a certificated aircraft. As now written, such engines and propellers are required to have been overhauled within the last 500 hours' time in service, the overhaul period recommended by the manufacturer, or the overhaul period established by the Administrator, whichever is the shortest. Used engines and propellers not being exported as part of a certificated aircraft must still be newly overhauled. In addition, the term "newly overhauled" has been clarified in line with industry's suggestion. As now defined, the term means that the product has not been operated, except for tests, since overhaul.

In connection with the performance of the periodic inspections and overhauls required by this regulation, the proposal stated that such inspections and overhauls must be performed and approved by, among others, certificated air carriers possessing adequate overhaul facilities and having a maintenance organization appropriate to the product involved. However, under the current provisions of Part 43 and Parts 121 and 127, an air carrier is authorized only to perform and approve maintenance, preventive maintenance, and alterations as provided for in its continuous airworthiness maintenance program and its maintenance manual and to perform these functions for another air carrier as provided in the continuous airworthiness maintenance program and the maintenance manual of the other air carrier. Therefore, in view of the foregoing limitations on the authority of air carriers to perform and approve periodic inspections and overhauls, the proposal requiring that such inspections and alterations be performed by air carriers has been deleted. It should be noted, however, that this deletion does not affect air carriers who also hold repair station certificates.

There was also some opposition to the requirement that copies of manufacturers' service bulletins must be furnished with each application for export approval of a Class I product. It was pointed out that this requirement is too broad and is unnecessary since, in the past, the practice has been to provide only a listing of the AD status of the aircraft. The Agency agrees that to require the manufacturer to furnish all the service bulletins applicable to a Class I product is not necessary and that the required information is that related to the airworthiness directives. Therefore, the regulation has been revised to specifically provide that the applicant for export approval need only furnish evidence of compliance with the applicable airworthiness directive.

It was also suggested that an exporter should not be required to forward all the historical records pertaining to the aircraft through governmental channels. It was stated that certain documents must be shipped with the aircraft so that they will be available for certification of the aircraft in a foreign country. The FAA did not intend to require that the historical documents be shipped separately from the product to which they apply. The regulation has, therefore, been clarified to permit the exporter to forward the documents by any means which he considers appropriate so long as such means is consistent with the special requirements of the importing country.

In addition to the foregoing, the proposal has been changed to provide for the issue of export approval for Class III products. Under the proposal, Class III products were not eligible for export approval because of the nature of such products. However, it has subsequently been determined that certain Class III products should be eligible for airworthiness approval. Therefore, the regulation has been revised to permit manufacturers holding production approval and employing persons authorized by the Administrator to issue Class III approvals, to obtain such approvals.

Interested persons have been afforded an opportunity to participate in the making of this regulation, and due consideration has been given to all relevant matter presented.

In consideration of the foregoing, Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended effective August 30, 1965, as follows.

This amendment is made under the authority of Sections 313(a), 601, and 603 of the Federal Aviation Act of 1958; (49 U.S.C. 1354, 1421, and 1423).

Amendment 21–3

Adopted: July 7, 1965 **Effective: August 13, 1965**

(Published in 30 F.R. 8826, July 14, 1965)

The purpose of this amendment to Parts 21 and 39 of the Federal Aviation Regulations is to remove certain procedural restrictions heretofore imposed on the FAA with regard to the issue of airworthiness directives (ADs). This action was published as a Notice of Proposed Rule Making (29 F.R. 6446) and circulated as Notice 64–26 dated May 16, 1964.

That Notice contemplated, first, the nonsubstantive recodification of pertinent Civil Air Regulations and Regulations of the Administrator into the Federal Aviation Regulations and, secondly, deletion of procedural restrictions on the Administrator's authority to issue ADs. The first step was accomplished by amendment published in 29 F.R. 14403, October 20, 1964. This amendment accomplished the second step.

Part 39 imposes two restrictions on the issue of ADs for unsafe conditions. The unsafe condition giving rise to an AD must (1) have been found as a result of service experience and (2) be with respect to a design feature, part, or characteristic. Both restrictions were originally imposed, prior to the Federal Aviation Act, by the Civil Aeronautics Board (CAB) when it delegated the authority to issue ADs to the Civil Aeronautics Administration (CAA). The Federal Aviation Act of 1958 combined the safety rule making authority of the CAB and CAA and vested it in the FAA and these carried-over restrictions are contrary to the intent of that Act. This amendment removes the two restrictions from the regulations and will allow ADs to be issued for unsafe conditions however and wherever found.

Most of the comments received in response to the Notice of Proposed Rule Making were directed to the remark in the preamble that "an unsafe condition that results from maintenance, as well as one due to a design defect, will be subject to the issuance of an airworthiness directive". The Notice stressed, perhaps unduly, this one cause of unsafe conditions whereas, in actuality, there are many causes. It is clear from the foregoing discussion that the responsibilities placed on the FAA by the Federal Aviation Act justify broadening the regulation to make any unsafe condition, whether resulting from maintenance, design, defect, or otherwise, the proper subject of an AD. At the same time the

Agency recognizes that use of ADs to correct improper or inadequate maintenance on the part of particular persons or organizations would impose an unreasonable burden on the vast majority of persons who comply with the regulations and properly maintain their aircraft. The Agency, accordingly, will not issue ADs as a substitute for enforcing maintenance rules. In addition, the present provision that the unsafe conditions must be likely to exist or occur in other aircraft effectively precludes the issue of ADs to correct problems arising from poor maintenance practices on the part of an individual operator.

Two other comments, suggesting that the revised regulations go beyond the minimum standards and reasonable rules and regulations authorized by the Federal Aviation Act, opposed deletion of the restrictions on the ground that the way would thus be opened for abuses by individual FAA personnel. This amendment, as such, imposes no additional requirements on anyone. Only when it is implemented through the issue of future ADs will it have any regulatory effect. The issue of ADs is governed by the Administrative Procedure Act and its provisions relating to public notice and procedure. In addition, we agree with the commentators that the Federal Aviation Act of 1958 allows only the issue of minimum standards and reasonable rules and regulations. ADs are no different than the other types of rules issued by this Agency and we cannot and will not issue an AD unless we are convinced that its need and scope are fully justified.

Since service experience would now be only one of several bases that may generate an AD requiring a design change, the § 21.99 catchline is being amended to read "Required design changes".

Interested persons have been afforded the opportunity to participate in making this amendment. All relevant material submitted has been fully considered.

In consideration of the foregoing, Parts 21 and 39 of the Federal Aviation Regulations are amended as follows effective August 13, 1965.

This amendment is made under the authority of sections 601 and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1421 and 1423).

Amendment 21-4

Airworthiness Certification of Limited Category Aircraft

Adopted: July 23, 1965 **Effective: July 29, 1965**

(Published in 30 F.R. 9437, July 29, 1965)

The purpose of this amendment is to remove the current cutoff date for the issuance of original airworthiness certificates in the limited category.

Section 21.189(c) provides that no person may obtain an airworthiness certificate in the limited category after June 30, 1965, unless he shows that the aircraft was previously issued an airworthiness certificate in the limited category.

Surplus military aircraft have not been eligible for type certification in the limited category (formerly Part 9 of the Civil Air Regulations) since December 31, 1947. Therefore, limited airworthiness certification of surplus military aircraft has been limited to aircraft for which an application for type certification was made prior to that time. However, to provide a basis for the continued certification of surplus military aircraft, the Agency adopted a new Part 9a (now § 21.27) effective January 10, 1964, which would permit such aircraft to be type certificated and to receive airworthiness certificates in the standard category. In view of the restriction on the certification of aircraft in the limited category which had existed since 1947 and in view of the provisions of the new Part 9a, designed especially for surplus military aircraft, the Agency believed that there was no longer any need in the public interest for the issuance of original airworthiness certificates in the limited category. Therefore, at the time of the adoption of the new Part 9a, the Agency issued Amendment 1-9 announcing that original airworthiness certificates in the limited category would not be issued after June 30, 1965. As the preamble to Amendment 1-9 indicates, the Agency was aware that in at least a few instances immediate termination of original airworthiness certification in the limited category could result in substantial economic hardship to some persons. Therefore it was determined that limited airworthiness certificates should continue to be issued through June 30, 1965, to permit persons who had acquired surplus military aircraft an opportunity to certificate them.

However, it has subsequently become evident that there is substantial public interest in the continuation of the issuance of limited airworthiness certificates. Furthermore, it now appears that a large number of aircraft are affected by the present regulation and that contrary to the Agency's previous understanding, many persons could suffer substantial economic hardship as a result of the regulation.

The Agency is aware that permitting the continued issuance of original airworthiness certificates in the limited category will not adversely affect safety. Under the present regulations, limited airworthiness certificates would only be issued for aircraft which have met the airworthiness requirements for type certification in the limited category and such aircraft would be subject to those limitations and conditions which the Administrator finds necessary for safe operation.

Since this amendment merely extends the provisions of an existing regulation and imposes no additional burden on any person, notice and public procedure hereon are unnecessary and good cause exists for making this amendment effective on less than 30 days' notice.

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421, and 1423).

In consideration of the foregoing, Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended effective July 29, 1965, by deleting paragraph (c) in § 21.189.

Amendment 21-5

Delegation Option Procedures for Products and Parts

Adopted: August 30, 1965 Effective: October 8, 1965

(Published in 30 F.R. 11373; September 8, 1965)

This amendment modifies Subpart J of Part 21 by (1) including additional types of aircraft and aircraft engines, (2) including parts for aircraft, aircraft engines, and propellers, and (3) removing the requirement that the manufacturer must employ a Designated Manufacturer's Certification Representative (DMCR) in order to use the Delegation Option Procedures.

This amendment is based on, and reflects industry comments concerning, Notice of Proposed Rule Making 65-2, published in the Federal Register (30 F.R. 953) on January 29, 1965. Except as modified by the following discussion, the reasons for these amendments are those in the Notice. Changes to the proposals in Notice 65-2, and Agency disposition of comments from industry, are as follows:

Certain rules governing the issue of Supplemental Type Certificates (STCs) and the amendment of airworthiness certificates were placed in the Notice to give the manufacturer the same privileges as were currently being proposed for air carriers and domestic repair stations under the Designated Alteration Station (DAS) procedures in Notice 63-17. Since Notice 63-17 excluded manufacturers, the equivalent proposal was made for manufacturers under Notice 65-2 to give full public notice with respect to manufacturers. Notice having been accomplished without significant opposition to the concept of extension of the DAS privileges to manufacturers, the rules covering the issue of STCs and the amendment of airworthiness certificates are deleted from this amendment and are to be included in new Subpart M of Part 21, which contains the DAS requirements. The Agency thus agrees with one comment from industry suggesting that the proper distinction between Subparts J and M of Part 21 is that between original type certification and supplemental type certification, respectively. This change is editorial only. The placement of the DAS requirements for the manufacturer in new Subpart M of Part 21 is subject to any changes made to Notice 63-17, which changes appear in the final requirements for DAS authorizations (see Docket No. 1713). This change affects proposed §§ 21.231, 21.235(b), 21.239(c), 21.241, 21.251(b)(2) and (b)(5), 21.263, 21.267, 21.269(c), and 21.293(b) and (c).

Industry commented that Agency participation in the manufacturer's type certification programs is not necessary when authority is delegated to responsible manufacturers, and requested that the Agency either divorce itself completely from involvement in the type certification programs of manufacturers, or else specify a certain frequency of inspection.

As stated in the Notice, the responsibility of the Agency for the type certification of products is clear under §§ 601 and 603 of the Federal Aviation Act of 1958. The power under § 314 of the Act to delegate any "work, business, or function" does not relieve the Administrator of the underlying duties prescribed in §§ 601 and 603 of the Act. The use of the power of delegation must clearly be consistent with the underlying duties, since the Act nowhere provides for the delegation of the duties themselves. Thus, § 314 provides that delegations made by the Administrator be made "*in exercising* the powers and duties vested in him by this Act" (emphasis supplied.) To completely divorce the Agency from the certification programs of manufacturers would be to ignore, rather than exercise, those powers and duties.

The only industry contention that the Agency can consider in this area is thus whether a specific degree, or frequency, of supervision or inspection should be specified, across the board, in the delegation option procedures themselves. If such a frequency were specified, it would defeat the proper administration of the delegation option procedures in two respects. For manufacturers who demonstrate that, for specific programs, less supervision is consistent with the Administrator's duty to promote safety, the specified frequency would be an unnecessary burden. In cases where more supervision is required in order to discharge that duty, the specified frequency would amount to an apparent limitation, imposed by the Administrator on himself, of the Administrator's power to effectively discharge his duties. Neither result is consistent with effective rule making. The proper administration of the delegation option procedures requires that the degree of supervision be adjusted to fit each case. For this reason, the preamble to the Notice stated that the Agency will "establish *appropriate* initial inspection intervals under §§ 21.249 and 21.293, and will modify the intervals of inspection *as service experience warrants*" (emphasis supplied). The assignment of a specific frequency of inspection would be an arbitrary action involving prejudgment of certification programs as yet unknown to the Agency.

In urging the divorce of the Agency from the type certification programs of manufacturers, one comment further cites the fact that § 314 of the Act provides that delegation under that section is subject to such regulations, supervision, and review as the Administrator "may" prescribe. The Agency agrees that § 314 does not *require* the prescription of particular regulations, supervision, or review of delegated functions. Nor is this assumed or relied on by the Agency in declaring its intent to review each certification program, on its own merits, in the interest of safety. Rather, the Agency in so doing is concerned, as stated above, with the duties prescribed in §§ 601 and 603 of the Act.

Regardless of the competence of individual manufacturers, which is not in issue here, these comments are inconsistent with the Administrator's duties under the Act and cannot be accepted.

With respect to proposed § 21.239, comments recommended that a specific, single individual be given the total responsibility delegated to the manufacturer in order to promote good management. The specific manner in which the manufacturer discharges his delegated responsibilities are management prerogatives that should not be controlled by the Agency unless, in an individual case, specific practices adversely affect safety, in which case appropriate changes to those practices will be made.

Two changes are made to § 21.239. First, paragraph (a) is amended to make clear the original intent of that paragraph to cover only type certificates issued to the manufacturer under standard procedures, that is, under Subpart B of Part 21. Section 21.239 has never been administered to include type certificates transferred to the manufacturer since the assumption of underlying certification experience and ability cannot generally be made in such cases. This change is clarifying only. Second, whereas proposed § 21.239(c) allowed the appropriate staff to be employed "or available," this amendment requires the staff to be employed. This preserves the intent of § 21.239(c), as it was before this amendment. The type certification of entire products involves a continuous need for a staff competent to conduct all phases of certification, from initial design to production. Evaluation of such a staff by the Agency, as of the time that eligibility for a delegation option authorization is being determined, must be done prospectively, on the assumption that the staff will be continuously used by the manufacturer. Whereas, for the DAS, the need for specific personnel may be infrequent and difficult to define prospectively with respect to specific personnel requirements (since the precise nature of individual supplemental type certification programs may not be known when initial eligibility is being determined), the kind of activity to be involved in original type certification programs must be known to the Agency when application for a delegation option authorization is received , and the existence, at that time, of a complete, organized staff capable of executing all phases of those programs is thus essential to responsible delegation, by the Agency, in the field of original type certification. Therefore, while responsible delegation to a DAS requires only that qualified specialists be available when needed, such delegation in the field of type certification requires that the complete staff be employed so that it can be evaluated, as a complete staff, before a delegation authorization is granted.

The Notice provided for the issue of airworthiness approval tags for engines and propellers manufactured under the delegation option procedures. This amendment broadens this to include the issue of airworthiness approval tags for parts of products. The proposed delegation of responsibility to issue airworthiness certificates for complete aircraft and airworthiness approval tags for other complete products can safely include responsibility to issue airworthiness approval tags for parts of such products. This change appears in §§ 21.231, 21.251, and 21.271. In addition, proposed § 21.271 is changed to make it clear that it applies to all products included in the limits of applicability section (§ 21.251).

One industry comment recommended deleting the requirement in proposed § 21.261 that the manufacturer obtain the Administrator's concurrence respecting the application of the pertinent equivalent safety provisions. The authority to make interpretations requiring substitution of one airworthiness rule for another has never been delegated to private persons, since it involves the prescription of airworthiness standards rather than the selection and application of standards already prescribed by the Administrator. Only the latter is delegated by this amendment.

The numbering of the following sections has been changed to preserve the numbering of present Part 21: Proposed § 21 269 is now § 21.273; Proposed § 21.273 is now § 21.269.

One comment suggested that the statement in the preamble to the Notice, to the effect that the experimental certification requirements of Subpart H of Part 21 will continue to apply to holders of delegation option authorizations, could cause some confusion with the specific experimental certification requirements in the proposal. As in any case where specific requirements differ from general requirements, the general requirements apply where the specific requirements are silent. The statement in the Notice thus means that, where the delegation option procedures apply, they supersede those in Subpart H, and where the delegation option procedures are silent, Subpart H will govern experimental certification.

One comment concerning proposed § 21.275(a)(1) recommended deleting the proposed requirement that the issue of experimental certificates be limited to those aircraft for which the manufacturer has applied for a type certificate. The comment specifically recommends that the authorization to issue experimental certificates be broadened to cover experimental aircraft used for research and development not aimed at obtaining a type certificate. The intent of the proposals in the Notice is solely the delegation of functions related to the manufacturer's type certification programs covered by the delegation option procedures. No intent to delegate unrestricted experimental certification functions to private persons has been contemplated, justified, or developed in the Notice. This comment cannot, therefore, be accepted.

It was further recommended that proposed § 21.275(a)(2) be deleted as surplusage, since the more general provisions of § 21.275(a)(1) appear to cover aircraft that have undergone changes requiring flight tests. Insofar as an amended type certificate is a form of a type certificate, the comment is correct and is accepted. However, the distinction between proposed § 21.275(a)(1) and (a)(2) is important because the authority delegated to prescribe operating limitations for experimental certificates issued by the manufacturer is limited to experimental certificates issued pursuant to amendments of existing type certificates, whereas this authority is not intended to be delegated with respect to new designs involving an original, rather than amended, type certificate. This specific limitation is preserved in this amendment (see § 21.275(b)).

One comment concerning § 21.275(b) recommended requiring that the manufacturer, not the Administrator, specify the limitations to be placed on an experimental certificate. It is recognized that the manufacturer may have need for limitations that would not be considered necessary for safety by the Administrator, and that the proposed language appears to preclude the prescription of those limitations by the manufacturer. This comment is accepted, in part, with respect to aircraft for which the manufacturer holds the type certificate and has applied for an amended type certificate, and which have undergone changes requiring flight tests. The rule is changed to let the manufacturer specify the limitations and conditions that he considers necessary for operation, under an experimental certificate, of aircraft to be operated to show compliance with the applicable airworthiness requirements if the manufacturer has submitted an application for an amended type certificate. However, complete divorce of the Agency from responsibility for the safe operation of aircraft under experimental certificates is not intended. Therefore, this amendment, like the Notice, requires the manufacturer to obtain any limitations and conditions that the Administrator considers necessary for safety in every case in which an experimental certificate is issued by the manufacturer.

Certain editorial, nonsubstantive changes have been made to §§ 21.277, 21.283, and 21.285. Section 21.277(a) is streamlined and shortened to include only its mandatory elements. Section 21.277(b) is deleted as surplus with § 21.249. Section 21.277(c) is deleted because it adds nothing to the combined effect of §§ 21.249 and 21.293(b). Sections 21.277(d) and 21.283 are deleted as nonmandatory and as unnecessary under the powers vested in the Administrator by § 314 of the Act. Finally, §21.285 is deleted as nonmandatory and because the processing of certificate actions is covered by Part 13 of the Federal Aviation Regulations.

After further consideration and in response to comments received, the change proposed to § 21.289 in Notice 65-2 has not been incorporated in this final amendment. Under current § 21.289, a DMCR employed by a manufacturer may approve major repairs and alterations. Since under this regulation, the manufacturer now holds the delegated authority from the Administrator, the Agency considers it appropriate to continue in effect the present provisions of § 21.289 for such manufacturer.

One comment recommended deleting the requirement in § 21.289 that employees authorized by the manufacturer to sign FAA Form 337 and make required log book entries be listed on the manufacturer's delegation option authorization application. No burden is created by this requirement since it does not describe who may or may not be listed. Further, it aids the efficient administration and control of approvals made under § 21.289. This comment cannot, therefore, be accepted.

Interested persons have been given an opportunity to participate in the making of this amendment, and careful consideration has been given to all relevant matter presented.

In consideration of the foregoing, Chapter I of Title 14 of the Code of Federal Regulations is amended, effective October 8, 1965, as hereinafter set forth.

This amendment is made under the authority of sections 313(a), 314, 601, 603, 608, and 609 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1355, 1421, 1423, 1428, and 1429).

Amendment 21-6

Designated Alteration Station (DAS) Authorizations For Manufacturers, Air Carriers, Commercial Operators, and Domestic Repair Stations

Adopted: August 30, 1965 **Effective: October 8, 1965**

(Published in 30 F.R. 11376; September 8, 1965)

This amendment lets eligible air carriers (except air taxi operators), commercial operators of large aircraft, domestic repair stations, and manufacturers of products act as designated alteration stations (DAS) for the purpose of (1) issuing supplemental type certificates (STCs) for type certificated aircraft, aircraft engines, and propellers, (2) issuing experimental certificates for aircraft that are altered by the DAS under such

STC's and require flight tests and (3) amending standard airworthiness certificates for such aircraft.

This amendment is based on, and reflects industry comments concerning, Notice of Proposed Rule Making 63-17, published in the Federal Register (28 F.R. 4095), on April 25, 1963. Except as modified by the following discussion, the reasons for these amendments are those in the Notice. Since Part 21 is now effective, this amendment adds a new Subpart M to that Part rather than a new Part 411 as proposed in the Notice of Proposed Rule Making. This new subpart is arranged and numbered to correspond, where appropriate, to similar sections in Subpart J. In the following discussion, references to Part 411 refer to section numbers in the Notice. The applicability of this amendment is changed from that of the Notice in three respects. The Notice proposed to include air taxi operators, exclude all commercial operators, and exclude manufacturers of products. This amendment excludes air taxi operators, includes commercial operators of large aircraft, and includes manufacturers of products.

When Notice 63-17 was published prior to the adoption of Part 135 *Air Taxi Operators and Commercial Operators of Small Aircraft*, air taxi operators, *as such*, had a regulatory basis for the performance of maintenance, since they could establish and follow a continuous airworthiness maintenance program, similar to those of other air carriers, under the deviation authority of former Part 42. Part 135, under which air taxi operators must now operate, does not provide for the performance of maintenance by air taxi operators, nor does Part 43 *Maintenance, Preventive Maintenance, Rebuilding, and Alteration*, let air taxi operators perform maintenance *as air taxi operators*. As the preamble to the Notice stated, the Agency intends to give DAS authorizations to air carriers only for products that they are "authorized to maintain and operate" under their operating certificates. There is currently no regulatory basis for such authorizations with respect to air taxi operators.

Commercial operators of large aircraft, on the other hand, have a regulatory basis for maintenance authority under their operating certificates. The maintenance requirements of Part 121 *Certification and Operations: Air Carriers and Commercial Operators of Large Aircraft* apply, without significant distinction, to "all certificate holders." Part 43 provides that commercial operators may perform maintenance as prescribed in their operating regulations. There is no valid reason for excluding commercial operators of large aircraft as a class.

For all applicants, individual eligibility for a DAS authorization must of course be determined under § 21.439 of this amendment.

The extension of the applicability of the DAS requirements to cover manufacturers of products follows Notice 65-2, published in the Federal Register (30 F.R. 953) on January 29, 1965, in which it was stated that the reasons advanced in Notice 63-17 for giving the DAS privilege to air carriers and domestic repair stations "are valid for manufacturers with respect to products for which they hold the type certificate." Requirements analogous to those proposed in Notice 63-17 were thus given public notice in Notice 65-2. While comments to Notice 65-2 suggested that the application of the DAS requirements to the manufacturer of products should be done in new Subpart M (which is the subject of this amendment), no comments were received which indicated that the manufacturer of products should be differently regulated, as a DAS, than are air carriers or domestic repair stations. Notice having been given for the manufacturer in this respect, the manufacturer is included in this amendment subject to all changes made as a result of comments to Notice 63-17. Since the experience and capability upon which the Agency relies in delegating DAS functions to the manufacturer, as to the other persons covered by this amendment, is the demonstrated alteration ability of the applicant, and since the manufacturer's alteration authority, under which such alteration experience and capability must be derived, is defined in § 43.3(i), the products for which the manufacturer is authorized to obtain a DAS authorization are limited, consistent with § 43.3(i), to those which he is authorized to alter, namely, those which are manufactured by him and for which he holds a type or production certificate, or which he manufactured under a Technical Standard Order or Product and Process Specification issued by the Administrator.

Section 21.113 of the Federal Aviation Regulations requires each person who does not hold the type certificate for a product to apply to the Administrator for the issue of an STC for each major change in type design that does not require a new type certificate. This procedure has caused delays in the approval of STCs and thus in the making and approval of major alterations under such STCs. The cause and need for these delays have been studied by the Agency in cooperation with an industry committee representing modification facilities. The committee recommended that, while the STC program should be continued, the delays can and should be lessened by letting qualified repair stations issue STCs as well as make and approve major alterations.

After studying the committee's recommendation in the light of experience gained in issuing STCs and evaluating alteration programs, the Agency believes that the need to eliminate unnecessary delay justifies the requested delegation, not only with respect to many domestic repair stations, but also with respect to many air carriers and manufacturers. The Agency welcomes this opportunity to keep the burden on regulated persons to the minimum consistent with its responsibility under the Federal Aviation Act of 1958.

In carrying out its responsibility under Title VI of the Act, the Agency will evaluate the certification programs under §§ 21.441 and 21.493, conduct periodic inspections of the activities of each DAS, establish appropriate inspection intervals under §§ 21.449, 21.451, and 21.493, and modify these intervals as service experience warrants. Any additional limitations necessary to ensure the adequacy of individual certification programs will be imposed under § 21.451.

Section 21.1(a)(4) is deleted since (a)(1) is broad enough to cover new Subpart M and the applicability section (§ 21.431) speaks for itself.

One comment requested that air carrier applicants be required to have repair station certificates with appropriate ratings. The eligibility requirements of this amendment impose an equal burden on repair stations and air carriers. The Agency believes that, within the limitations of their respective operating certificates, an air carrier who meets the eligibility requirements of this amendment has a level of responsible expertise equal to that of a certificated repair station who also meets those requirements. Therefore, to require an air carrier to obtain a repair station certificate would be a mere formality. These considerations also apply to commercial operators of large aircraft.

Proposed § 411.34 would have required the DAS to obtain an experimental certificate, with appropriate limitations, from the Agency for each aircraft that, after alteration, requires flight testing to establish compliance with the applicable airworthiness requirements. That section would also have permitted the DAS to "issue" an airworthiness certificate (other than experimental) upon the satisfactory completion of the required flight testing. This proposed section is changed in two respects under this amendment. First, the DAS is given authority to issue experimental certificates subject to any limitations and conditions deemed necessary for safety by the Administrator. The Agency believes that necessary flight testing can be safely expedited in this manner without requiring separate application by the DAS for an experimental certificate for each aircraft of the same type identically altered under the same STC. The limitations and conditions imposed by the Administrator would apply to each experimental certificate issued by the DAS for these aircraft. This relaxing change appears in §§ 21.451 and 21.475. Second, the word "issue", with respect to airworthiness certificates other than experimental, is changed to "amend". This clarifying change involves no substantive departure from the Notice of Proposed Rule Making. Questions have been raised as to whether the word "issue" includes the original airworthiness certification of aircraft that have never been airworthiness certificated, and as to whether it includes the issue of a standard airworthiness certificate for aircraft that come to the DAS in another (e.g. restricted) airworthiness classification. While the preamble attempted to prevent such confusion by stating that the DAS may "reissue" standard airworthiness certificates, this has raised the further question whether the DAS, under his authority to "issue" airworthiness certificates, may "reissue" a standard airworthiness certificate, after flight testing, for an aircraft whose airworthiness certificate has been surrendered, revoked, or otherwise terminated. None of these questioned privileges are within the intent of the Notice. The intent of the Notice with respect to airworthiness certification, which remains unchanged in this amendment, is as follows: After altering an aircraft having an effective standard airworthiness certificate, and after satisfactorily completing all necessary flight tests under an experimental certificate, the DAS may return the altered aircraft to the standard airworthiness classification, thus establishing, without independent Agency concurrence, that (1) the aircraft, as altered, conforms to the type design and the new type design data providing the basis for the STC issued by the DAS, and (2) the aircraft is in condition for safe operation. This is the meaning of the term "amendment" as used in the regulations and in FAA Form 305, Application for Airworthiness Certificate. Procedurally, the DAS may sign the Form 305 without independent signature by an Agency inspector, and he will merely be required to send the completed application to the Agency for information. This change to "amend" appears wherever "issue" was used in the Notice.

Section 21.439(b) (411.10(b)) prescribes the minimum staff qualifications for a DAS authorization. Comments asked whether all of the listed qualifications must be met by one person rather than met collectively by several persons. These qualifications are generally those required of an FAA Designated Engineering Representative, and are the minimum necessary for evaluating an STC program. Section 21.439(b) therefore makes it clear that all of the listed requirements must be met by a single person. Comments further suggested that the DAS staff be employed by the DAS rather than be merely "available". So long as the required staff is in fact available when needed, a requirement that the staff be employed would be surplus with respect to the objective of the rule, and would unnecessarily prevent otherwise qualified applicants from participation in the DAS program. This suggested change is not necessary for safety and is therefore rejected.

The preamble to Notice No. 63–17 proposed to exclude repair stations with limited ratings from participation in the DAS procedures. The stated reason for this exclusion was the need for a DAS to be "capable of performing and approving the alteration work itself". Each repair station's qualifications will be carefully evaluated under § 21.439. Each repair station must meet the applicable requirements of Part 145, particularly §§ 145.35 through 145.39. With minor exceptions, these sections do not distinguish between repair stations with and without limited ratings. The permanence and quality of the facilities of each repair station are continuously under Agency supervision under Part 145. Given full compliance with that Part, the Agency believes that the distinction between repair stations with and without limited ratings should not determine eligibility under the DAS procedures, and that failure to qualify should be determined by individual evaluation of each repair station's qualification under Subpart M of Part 21, particularly § 21.439.

Proposed § 411.12 is omitted in the final rule since the authorization language is surplus and the note material is nonregulatory. No substantive change results from this deletion.

Section 21.441 contains the procedure manual material proposed in § 411.32. The final rule requires that the applicant submit and obtain approval of the manual before acting as a DAS, rather than merely "provide" the manual as in the Notice. This is done since the manual is one means of Agency supervision of the certification activities of the DAS. To further serve this end, and to carry out the proposed requirement (§ 411.32(b)) that the manual at all times reflect the current staffing and procedures that are being used, this requirement is combined with the requirement, proposed in §§ 411.14(b), that the DAS obtain prior approval of changes in facilities or staff necessary to continue to meet the eligibility requirements of § 21.439 (§ 411.10). The manual is an appropriate place to reflect the necessary approval. Comments suggested that the words "prior approval" in § 411.14(b) could be interpreted to prevent all DAS activity until approval is obtained. This language is therefore changed in § 21.441(b) to prohibit only the continued performance of functions actually affected by the change. Thus, if the DAS is qualified to issue STCs for products of more than one type, and the specified changes affect only the issue of STCs for one of those types, only that activity would be prohibited until the changes are approved by the Administrator and entered in the procedure manual. Similarly, if the specified changes affect only the airworthiness certification activity of the DAS, only that activity would be prohibited. This places a realistic limitation on the "current staffing and procedures" requirement in § 411.32(b) by preventing departures from proper procedures without at the same time requiring unnecessary paper work or unnecessary curtailment of unaffected activities.

Section 411.13 proposed to require return of the authorization certificate when the DAS no longer "intends" to operate as a DAS, and proposed to terminate the authorization automatically one year after issue. The subjective test for return of the certificate is replaced with an objective test based on effectiveness of the certificate itself. The one-year requirement is deleted since the added supervision incident to annual renewal would add little to the supervision and inspection already provided for in the DAS procedures during the year of operation itself. There being no need for renewal, the 60–day renewal period is of course deleted.

The maintenance-of-eligibility requirement (§ 411.14) has been changed insofar as the prior-approval requirement has been moved to the procedure manual section (§ 21.441) and no longer directly determines continued eligibility, and insofar as the requirement to continue to meet the requirements for issue of the authorization is now modified, in § 21.445, to allow a 48-hour period in which to bring suspected cases of noncompliance to the attention of the Administrator without penalty. It should be noted that this section requires continued compliance with the requirements for issue of the DAS authorization regardless of whether any DAS function is being performed, whereas § 21.441(b) prohibits the performance of "affected" DAS functions in the face of the specified changes. The 48-hour period in § 21.445 does not apply to § 21.441(b).

One comment questioned the need for the inspection provision of § 411.16. Section 314 of the Act provides that delegations of the kind involved in this amendment are subject to such supervision and review as the Administrator may prescribe. The Agency regards the inspection procedures of § 411.16 as a necessary basis for such supervision and review in the case of designated alteration stations. Section 21.449 thus preserves this inspection provision. However, in the light of the provisions of § 21.451(c) and § 21.493, the second sentence of § 411.16 is deleted as surplus.

Section 411.33 is changed in two respects in § 21.463. First, § 21.463 makes it clear that the procedure manual must be followed in the issue of STCs. This carries out the intent of § 411.32. Second, the requirement in § 411.33 that the DAS obtain the Administrator's concurrence with submitted data is, with one exception, omitted in § 21.463. This is in reponse to comments questioning the need for concurrence in addition to the other provisions for review by the Administrator. The exception concerns the equivalent safety provisions under § 21.21. If the airworthiness requirements that the applicant determines to be applicable include the application of equivalent safety provisions, the Administrator's concurrence must, as in the delegation option procedures of Subpart J of Part 21, be obtained. The authority to make interpretations requiring substitution of one airworthiness rule for another has never been delegated to private persons since it involves the prescription of airworthiness standards rather than the selection and application of standards already prescribed. Only the latter is delegated. A requirement, similar to that in § 21.261, is thus added to this amendment (§ 21.461) to make it clear that (1) the use of equivalent safety provisions is not precluded, and (2) such use requires the Administrator's concurrence.

Under proposed § 411.33, failure of the DAS to determine the applicable FAA policies, procedures, and practices would have been a technical violation. While the Agency makes this information available for public information, it is within the exclusive control of the Agency and does not automatically receive the public exposure given rules. Periodic review will be made to advise the DAS with respect to this information, but the determination of which policies, procedures, and practices apply is not made the subject of a rule.

Section 21.477 (§ 411.35) makes it clear that the DAS need not act under the rule until notified by the Administrator.

Proposed § 411.36 is omitted in the final rule. The rules in this amendment prescribing the DAS responsibility, and the Administrator's authority under § 314 of the Act to rescind any delegation for any appropriate reason, make a formal noncompliance section unnecessary.

Section 21.493 makes more specific the intent in § 411.37 that the technical data file (now in § 21.493(a)(1)) need include only those records necessary for the issue of the STC, and that only this data file need be transferred to the Administrator.

Proposed § 411.38 is omitted as nonregulatory. That proposed section does, however, reflect Agency policy with respect to protecting the interests of the holders of STCs. The Agency will publish lists of STCs whose holders agree to make them available to others and for which data will support the making of identical alterations. Data submitted under new Subpart M will not be released without written permission from the owner of the data.

Proposed § 411.39 is omitted as surplus in the final rule. This amendment in no way affects the production certification procedures of Subpart G of Part 21.

One comment suggested that helicopters above a certain maximum weight should be excluded from the DAS procedures. No STC may be issued for any product under this amendment unless all applicable airworthiness requirements, substantive and procedural, are met. Except where helicopter weight affects those requirements, or limits alteration authority under an applicant's operating certificate, no valid reason exists for making that weight determine eligibility under the DAS procedures.

One comment suggested that independent engineering firms be eligible for a DAS authorization if a suitable, but separate, repair station is available to make the alterations. All or part of such a firm may be employed by, or available to, a repair station that meets the other requirements for a DAS authorization (see § 21.439(a)(4)). This provision demonstrates the Agency's confidence in the competence of the independent engineering firm. However, this relationship of employment or availability cannot be reversed to qualify the independent engineering firm as a DAS in its own right, regardless of its competence. Continued, ready supervision of facilities, staff, and data by the Agency is the basis on which delegation in this field can be made practical. Holders of DAS authorizations may make the major alterations that they approve under the authorization. A repair station's ratings and limitations are approved and reviewed by the Agency, and its facilities are known to the Agency through an existing certification process. No similar process assures that an engineering firm will have a permanent business location or continued access to a qualified alteration facility. Supervision is difficult where the technical data and the product being altered are remote from each other. For these reasons, § 21.439 requires that the DAS must "have" the appropriate alteration facilities, rather than merely have them "available". This suggestion must, therefore, be rejected.

Interested persons have been given an opportunity to participate in the making of this amendment, and careful consideration has been given to all relevant matter presented.

In consideration of the foregoing, Chapter I of Title 14 of the Code of Federal Regulations is amended, effective October 8, 1965, as hereinafter set forth.

This amendment is made under the authority of §§ 313(a), 314, 601, 603, 608 and 609 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1355, 1421, 1423, 1428, and 1429).

Amendment 21-7

Duration of Class I Provisional Type Certificate

Adopted: November 8, 1965 Effective: November 16, 1965

(Published in 30 F.R. 14310; November 16, 1965)

The purpose of this amendment to Part 21 of the Federal Aviation Regulations is to prescribe a 24-month fixed duration for a Class I provisional type certificate.

In a typical industry situation, Class I provisionally type certificated prototype aircraft which are being used for sales demonstrations, market surveys, development projects and the like during the type certification process, are not in conformity with type design at the time the type certificate issues. Since, under the present requirements of §§ 21.77 and 21.217, a Class I provisional type certificate and associated provisional airworthiness certificates expire at the time of issue of the type certificate, the manufacturer must at that time either cease whatever operations he is conducting with those aircraft until they are brought into conformity with the type design or curtail his operations under an experimental certificate.

The Agency is aware that neither of these alternatives is necessary in the interest of safety and in recognition of this fact and the fact that the present requirement imposes a hardship on the manufacturers, the Agency has previously granted exemptions extending the duration of Class I provisional type certificates.

In the light of the foregoing, the Agency considers it appropriate to amend the regulations to permit all manufacturers to continue to use provisionally certificated aircraft under the conditions and limitations applicable thereto, for a total of 24 months notwithstanding the fact that a type certificate has been issued for the aircraft.

This amendment deletes those portions of § 21.77 that automatically terminate the effectiveness of a Class I provisional type certificate upon issuance of the corresponding type certificate, supplemental type certificate, or Class II provisional type certificate. In giving the Class I provisional type certificate a definite duration, it is brought in line with the duration provisions for Class II certificates.

Since this amendment removes an unnecessary restriction and imposes no additional burden on any person, the Agency finds that notice and public procedure on this amendment are unnecessary and that good cause exists for making it effective on less than 30 days notice.

This amendment is made under the authority of Sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423).

In consideration of the foregoing, § 21.77(b), Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended, effective November 16, 1965.

Amendment 21-8

Miscellaneous Amendments to the Export Airworthiness Approval Procedures

Adopted: January 28, 1966 **Effective: January 28, 1966**

(Published in 31 F.R. 2421, February 5, 1966)

The purpose of this amendment to Part 21 of the Federal Aviation Regulations is to clarify the existing regulations concerning those persons authorized to perform the inspections required for certain classes of export approval and to delete the overhaul requirement presently applicable to used engines, propellers, and appliances, exported as a part of an aircraft.

Under the current requirements of § 21.329, used aircraft must have undergone a periodic inspection and be approved for return to service in accordance with the applicable provisions of Part 43 of the Federal Aviation Regulations. In addition, used engines and propellers which are not being exported as part of a certificated aircraft must have been newly overhauled. In accordance with the provisions of Part 43, mechanics holding inspection authorizations are authorized to perform periodic inspections and overhauls to the extent provided in Part 65 of the Federal Aviation Regulations and air carriers and commercial operators are authorized to perform similar functions as provided in Parts 121 or 127 of the Federal Aviation Regulations. Under Parts 121 and 127, air carriers are limited to the performance of maintenance on their own or other air carrier aircraft in accordance with applicable continuous airworthiness maintenance programs and commerical operators are limited to performing maintenance on their own aircraft in accordance with such programs, and the Agency has applied such limitations to their performance of the necessary inspections and overhauls for export approvals. However, notwithstanding the foregoing, the present provisions of § 21.337 do not list air carriers, commercial operators or persons holding inspection authorizations as being authorized, under any condition, to perform the inspections and overhauls required for export airworthiness approval. The notice of proposed rule making that preceded the adoption of present § 21.337 listed air carriers as persons authorized to perform the required inspections and overhauls for export approval. However, as the preamble of the final amendment clearly indicates, air carriers were not included in the provisions of § 21.337 as proposed in order to remove the implication that the air carriers could perform the required inspections and overhauls without limitations and not to prevent air carriers from performing such functions within the limitations imposed by Parts 121 and 127. This would also be applicable now to commercial operators conducting their operations under Part 121. This oversight has created considerable confusion and the provisions of § 21.337 require clarification. For this reason, the requirements of § 21.337 have been amended consistent with the foregoing to include air carriers, commercial operators and the holders of inspection authorizations.

In addition to the foregoing, the provisions of § 21.329 have been amended by deleting the requirement that used engines, propellers and appliances being exported as part of an aircraft must have been overhauled within the last 500 hours' time in service prior to being exported. The Agency now considers that this requirement is unnecessary for the purpose of establishing the airworthiness of such products in the light of the existing requirement that used aircraft being exported must have undergone a periodic inspection and be approved for return to service. Under a periodic inspection, the condition of the engines, propellers and appliances installed on an aircraft must be investigated and if it is found that an overhaul of such engines, propellers or appliances is necessary in order to make them airworthy, the aircraft cannot be approved for return to service until such ovehaul has been performed. As amended herein, only the necessary overhauls of used engines, propellers and appliances need be performed and exporters would be relieved of the substantial economic burden of overhauling engines, propellers, and appliances regardless of the actual condition of such products as required under the current rules.

Finally, as noted above, § 21.329(c) requires that used aircraft must have undergone a periodic inspection and be approved for return to service in accordance with the applicable provisions of Part 43 of the Federal Aviation Regulations. In addition, it requires that this inspection must have been performed within 30 days before the date the application is made for an export certificate of airworthiness. The requirement for a periodic inspection was intended only to identify the scope of the inspection which the Agency considers necessary for export approval of used aircraft and the rule has been amended to make this clear. Moreover, it has been brought to the attention of the Agency that the requirement for a periodic type of inspection does not take into proper account the scope of the other forms of inspections used on civil aircraft. In this connection, the present requirement requires a complete periodic type inspection notwithstanding that some of the inspections required under a periodic inspection may have already been accomplished under an established continuous airworthiness maintenance program or progressive inspection program within the 30 days prior to the date that the application for export approval was made. Therefore, to prevent the unnecessary duplication of inspections, the provisions of § 21.329(c) have been amended to permit consideration of inspections performed within 30 days prior to the date an application is made for export approval on aircraft maintained in accordance with a continuous airworthiness maintenance program under Part 121 or 127 of the Federal Aviation Regulations or a progressive inspection program under Part 91 of the Federal Aviation Regulations.

Since these amendments remove unnecssary restrictions, are clarifying in nature and impose no additional burden on any person, notice and public procedure hereon are unnecessary and they may be made effective on less than 30 days' notice.

In consideration of the foregoing, Part 21 of the Federal Aviation Regulations, (14 CFR Part 21) is amended effective January 28, 1966, as follows.

1. Section 21.329 is amended by striking out present paragraph (e) and by redesignating paragraphs (f) and (g) as paragraphs (e) and (f), and by amending paragraph (c).

2. Section 21.337 is amended by adding new paragraphs (d), (e), and (f).

These amendments are made under the authority of sections 313(a), 601 and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421 and 1423).

Amendment 21-9

Change of Name of "Periodic Inspection" to "Annual Inspection," and Clarification of 100-hour Inspection Requirement

Adopted: February 25, 1966 **Effective: April 2, 1966**

(Published in 31 F.R. 3336; March 3, 1966)

These amendments change the name "periodic inspection" to "annual inspection" throughout the Federal Aviation Regulations, and make clear the conditions under which an inspection satisfying the 100-hour inspection requirement of § 91.169(b) also satisfies the annual (formerly "periodic") inspection requirement of § 91.169(a). No substantive change is made by these amendments.

These amendments are based on, and are issued for the reasons contained in, Notice 65-26, published in the Federal Register (30 F.R. 13167), on October 15, 1965. All comments received in response to Notice 65-26 favored the changes proposed therein.

Comments not directly related to the notice suggested (1) that the references to Part 43 in § 91.169 be changed to references to Part 65, (2) that the "excess time" provision of § 91.169(b) be deleted, and (3) that the authority of the holder of an inspection authorization to approve products for return to service be made explicit in § 65.95(a)(2). These comments do not affect the disposition of Notice 65-26 and will be given future consideration.

In consideration of the foregoing, Chapter I of Title 14 of the Code of Federal Regulations is amended, effective April 2, 1966, as hereinafter set forth.

These amendments are made under the authority of sections 313(a) and 601 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a) and 1421).

Amendment 21–10

Cross Reference Corrections in FAR Parts 21, 33, 37, 43, 61, 63, 91, 127, 133, 141, 145, 149, and 183

Adopted: June 28, 1966 **Effective: July 6, 1966**

(Published in 31 F.R. 9211, July 6, 1966)

These amendments update certain cross references in the Federal Aviation Regulations and make other miscellaneous corrections.

At the time of the recodification, it was necessary to include in the Federal Aviation Regulations cross references to the Civil Air Regulations or Special Civil Air Regulations where the referenced provision had not yet been recodified. These amendments update all these cross references in instances where no substantive change is involved. In some instances, the cross references as updated herein have been anticipated in compilations and reprints of the respective Parts of the regulations.

For convenience, a table is utilized to state the changes that can be accomplished by a mere substitution of the proper cross reference.

The original publication of section 91.101(a) referred to the "Bureau of Commerce" instead of the "Bureau of Customs". This error is being corrected. The introductory sentence of subparagraph (b)(5) of Appendix B of Part 141 is corrected by the addition of a line of text that was inadvertently omitted in the recodification.

Since this amendment does not involve any substantive change and does not impose a burden on any person, notice and public procedure thereon are unnecessary, and the amendment may be made effective immediately.

In consideration of the foregoing, Chapter I of Title 14 is amended, effective July 6, 1966.

This amendment is made under the authority of section 313(a) of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a)).

Amendment 21–11

Export Airworthiness Approval

Adopted: September 16, 1966 **Effective: October 22, 1966**

(Published in 31 F.R. 12565, September 23, 1966)

The purpose of this amendment to Part 21 is to clarify the requirements of § 21.330 governing the issuance of special export airworthiness approvals for aircraft.

The United States has concluded reciprocal agreements with a number of foreign countries governing the import and export of aeronautical products. These agreements provide for the mutual validation or acceptance of export certificates of airworthiness issued for aeronautical products which are manufactured in and meet the airworthiness requirements of the country of export and any special requirements of the importing country.

Section 21.339 provides for the issuance of special export certificates of airworthiness for aircraft located in the United States that are to be flown to various foreign countries for the purpose of demonstrating the aircraft to prospective purchasers. Under this regulation an export certificate of airworthiness appropriate for validation or acceptance in any of the foreign countries involved may be issued prior to departure of the aircraft from the U.S. if, among other things, the special requirements of each of the prospective importing countries are met.

While the special requirements of some of the foreign countries with which the U.S. has reciprocal agreements specifically require that imported aircraft comply with certain of the airworthiness standards of those countries, the majority of the special requirements merely involve requests for various documents, information and materials related to the imported aircraft such as flight manuals, logbooks, and maintenance, overhaul and repair manuals.

In this connection, recent inquiries from certain U.S. manufacturers concerning § 21.339 indicate that some confusion exists as to whether the Agency intended to require an applicant for a special export certificate of airworthiness for an aircraft to furnish each of the prospective importing countries with the various documents, information and materials identified in their special requirements. These manufacturers have requested that the regulation be clarified in this respect.

As previously noted, the various reciprocal agreements provide for the mutual validation of export certificates of airworthiness issued for products which are manufactured in and meet the airworthiness requirements of the country of export and any special requirements of the importing country. Since the importing country is not known at the time an application for a special export certificate is filed, the Agency must necessarily determine that the applicant can meet the special requirements of each of the prospective importing countries at that time. It was not intended, however, that an applicant must furnish each of the prospective importing countries with the documents, information, and material specified in their individual special requirements, but merely that the applicant show that insofar as documents, information, and materials are involved, he can meet the special requirements of any of the countries that might subsequently import the aircraft. On the other hand, once a special export certificate of airworthiness is issued, the holder of the certificate has the responsibility under other provisions of the regulations to forward to the air authority of the importing country the documents, information, and material specified in the special requirements of that country.

For the foregoing reasons, the Agency considers it appropriate to amend § 21.339 to make it clear that an applicant for a special export certificate of airworthiness need only show that he has the documents, information, and material necessary to meet the special requirement of each of the prospective importing countries.

In addition, the present provisions of paragraph (5) relate to the holders of export airworthiness approvals rather than applicants for such approvals. Since substantially the same requirements are contained in § 21.335, which sets forth the responsibilities of exporters receiving an export airworthiness approval, the requirements of paragraph (5) are unnecessary under § 21.339 and have been deleted.

Finally, the present format of § 21.339 has been corrected consistent with the format of related sections of the regulations, and the cross reference to "§ 21.32" has been changed to "§ 21.327" to correct a typographical error.

Since this is a clarifying amendment and imposes no additional burden on any person, notice and public procedure hereon are unnecessary and the amendment may be made effective on less than 30 days' notice.

In consideration of the foregoing, § 21.339 of Part 21 of the Federal Aviation Regulations is amended, effective October 22, 1966.

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421 and 1423).

Amendment 21-12

Issuance of Class II Provisional Type Certificates and Provisional Amendments to Type Certificates to Foreign Manufacturers

Adopted: October 10, 1966 Effective: October 15, 1966

(Published in 31 F.R. 13387, October 15, 1966)

The purpose of this amendment to Part 21 of the Federal Aviation Regulations is to allow certain foreign manufacturers of aircraft to apply for and obtain Class II provisional type certificates and provisional amendments to type certificates. The objective of the regulation is to provide a means whereby air carriers can obtain as much experience as possible with foreign manufactured aircraft which, although safe for flight, have not been approved for the issuance of a type or amended type certificate.

This action was published as a Notice of Proposed Rule Making (31 F.R. 5969, April 19, 1966) and circulated as Notice 66-14 dated April 11, 1966. All of the comments received in response to the Notice expressed agreement with the objective of the proposal and supported the change. However, the comments also recommended additional changes as discussed below.

Expressing concern over deletion of the requirement that the 100-hours flight time for prototype aircraft must have been under an experimental certificate or under a Class I provisional airworthiness certificate, one commentator recommended that some provision be made to assure that the foreign country of manufacture has prototype requirements at least equivalent to U.S. standards. As the Notice stated, applicants for Class II provisional type certificates are limited to those foreign manufacturers who manufacture aircraft in a country with which the United States has an agreement for the acceptance of those aircraft for export and import. Moreover, since an applicant for a provisional certificate must have applied for a type certificate, the prototype requirements for the aircraft are governed by the provisions of § 21.29. Under that section, a foreign country must certify that the foreign manufactured aircraft has been examined, tested and found to meet the airworthiness requirements of the Federal Aviation Regulations or the airworthiness requirements of the foreign country and any other requirements the Administrator may prescribe to provide a level of safety equivalent to that provided by the Federal Aviation Regulations.

For the foregoing reasons, the Agency does not believe that added regulatory provisions are necessary to assure that the country of manufacture has prototype requirements at least equivalent to U.S. standards.

Another commentator, citing an exemption granted under the predecessor section of proposed § 21.85(d), stated its belief that the requirement for the FAA's flight test program to be in progress as a prerequisite for provisional amendment to a type certificate is unwarranted. The commentator then recommended that consideration be given to making that section compatible with the requirement for issuance of a Class II provisional type certificate.

Insofar as the requirements concerning the existence of a flight test program are concerned, the proposal merely added a clause recognizing that for foreign manufactured aircraft the flight test program would be identified as the program of the foreign country and not necessarily the FAA flight test program. Therefore, the recommendation to delete the requirement that a flight test program must be in progress at the time of the issuance of a Class II provisional type certificate or a provisional amendment to a type certificate goes beyond the scope of the Notice. Moreover, contrary to the commentator's position, an examination of the Notice in this matter reveals that the requirement concerning the existence of a flight test program is the same for the issuance of a Class II provisional type certificate as for the issuance of a provisional amendment to a type certificate.

Interested persons have been afforded the opportunity to participate in the making of this amendment. All relevant material submitted has been fully considered.

In consideration of the foregoing, Part 21 of the Federal Aviation Regulations is amended effective October 15, 1966.

This amendment is made under the authority of sections 313(a), 601 and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421, and 1423).

Amendment 21-13

Identification of Aircraft, Aircraft Engines, and Propellers

Adopted: January 3, 1967 **Effective: July 7, 1967**

(Published in 32 F.R. 187, January 10, 1967)

This amendment changes Part 21 to require compliance with the identification plate requirements of Part 45 as a prerequisite to the issue of certain airworthiness certificates, and changes Part 45 to broaden the pertinent identification plate requirements for aircraft, aircraft engines, and propellers. This amendment also removes appliances from Part 45. This amendment is based on, and is issued for the reasons contained in, Notice 66-15, published in the Federal Register on April 19. 1966 (31 F.R. 5991). Changes to the proposals in the Notice, and disposition of industry comments, are as follows.

One comment objected to proposed new section 21.182 because it would not require an aircraft altered under a Supplemental Type Certificate (STC) to have a changed or additional identification plate containing any new information related to the STC'd aircraft and that the identification plate on an STC'd aircraft should not continue to identify the modified aircraft with only the builder's name, serial number, and model designation pertaining to the holder of the type or production certificate. The Agency disagrees. The identification plate has but one function: It is a means by which the Agency can positively link a given aircraft with the proper documentation so that the continuing airworthiness history of that particular aircraft can be traced throughout its service life. The burden placed on the public by the identification plate requirements should be no greater than that necessary to fulfill this function. So far as linking a particular aircraft to its proper documents is concerned, it should be noted that, while the name of the builder is essential information on the original plate (for aircraft built under a type or production certificate as well as for aircraft built from spare and surplus parts), it is not necessary to require that the builder's name on the plate be changed or that new names be added to include persons who subsequently modify the aircraft under STC's. These later modifications will be reflected in the pertinent documents. These documents can be located and traced by the information on the original plate.

Several comments concerned the location of the aircraft identification plate. The proposed section would have only required the plate to be in an "accessible external location." In the light of several comments received, the Agency has determined that a reasonably uniform location should be adopted, since the main purpose of the location aspect of the identification plate requirements is to facilitate identification of the aircraft during inspections or in an accident. Therefore, this amendment requires the aircraft's identification plate to be in an accessible location "near an entrance." An external location is not required. An "accessible location near an entrance" should allow the maximum amount of protection for the plate in an accident while at the same time leaving the plate available for normal inspection.

Two comments concerned the proposed "permanent" nature of the identification plates for aircraft and for aircraft engines. The comments indicated that the Agency might want the plates removed for alteration or replacement, and that, if they were permanent in nature, this would be an impossibility. The Agency agrees. Literal permanence is not intended. This amendment (§ 45.11(a)) therefore merely requires that identification plates for both aircraft and aircraft engines be secured so that they "will not be likely to be defaced or removed during normal service, or lost or destroyed in an accident." Consistent with this change, the propeller identification requirements are amended (in § 45.11(b)) by deleting the reference to "permanent" identification, and by replacing that reference with (1) a reference to a "fireproof" identification, and (2) a requirement that the marking be such that it "will not be likely to be defaced or removed during normal service, or lost or destroyed in an accident."

One comment stated that proposed § 21.182 would require a new identification plate each time the airworthiness classification is changed. The Agency assumes that this concern is caused by the proposed language "each applicant . . . must identify his aircraft as prescribed . . ." This result is not intended. Section 21.182 therefore is changed from the Notice by specifically excluding changes of already identified aircraft from one airworthiness classification to another. Further, the Agency does not believe it necessary to require the applicant to actually perform the identification. Section 21.182 therefore only requires that the applicant "show that the aircraft is identified as prescribed in § 45.11(a)."

One comment suggested that section 45.11(a) should require that the marking on the fireproof plate that is affixed to aircraft and aircraft engines should also be fireproof. This change has been incorporated into the rule. A fireproof plate without fireproof markings would have limited identification value.

One comment recommended that the identification plate for aircraft engines be placed on the main case. The rule requires that the engine's identification plate be accessible, and not easily damaged. It is true that, on some engines, the main case might be an accessible location. However, it need not be so for every engine. Therefore, rather than fix a uniform location, it is more practical to require only that the plate be accessible. This comment cannot, therefore, be accepted.

One comment suggested that the serial numbers shown on the aircraft's identification plate should be correlated with the type design, rather than with its model number. The commentator stated that this would avoid duplication of model and serial numbers, creating an ambiguity between aircraft that are not built under a type or production certificate, and those that are. The Agency recognizes the fact that there might be duplication of serial numbers, since this amendment does not require persons who build aircraft from spare and surplus parts to determine and avoid using all serial numbers assigned to all past, present, and future aircraft of that model by the holder of the type or production certificate. Further, as indicated in the Notice, the regulation would require persons who build aircraft from spare and surplus parts to list the model designation under the type design to which conformity will be shown. The aircraft's model number will thus be duplicated in arriving at the finding of conformity. However, notwithstanding these serial number and model designation duplications, no ultimate identification ambiguity should result under this amendment. Section 45.13(a)(1) requires the builder's name to appear on the plate. In most cases the builder's name alone will distinguish aircraft not built under a type or production certificate from aircraft that are so built. In addition, § 45.13(a)(5) requires the production certificate number, if any, to appear on the plate. Thus, even if two or more builders of the same model aircraft should duplicate serial numbers, no ambiguity will result unless all of the builders have the same name and none of them hold production certificates. The probability of this is low enough to justify not accepting this comment. However, if ambiguities should arise in this connection, some further means of distinguishing between aircraft built under a type certificate or production certificate, and other aircraft, will be made.

Another comment questioned the need to include the date of completion of the product on the identification plate, as provided by the proposed amendment to § 45.13(a)(4). The Agency accepts this comment both as to the date of completion and as to the date of manufacture (which was required by § 45.13(a)(4) prior to this amendment). Amended § 45.13(a)(3) requires every builder to give his aircraft a serial number, and place it on the aircraft's identification plate, whether or not the aircraft is built under the terms of a type or production certificate. Except for antique aircraft, the date of manufacture can be readily discovered through the serial number of the aircraft. A requirement for this date to appear on the identification plate would therefore appear to be unnecessary. For antique aircraft the age of the aircraft can generally be determined from the manufacturer's records, or from the original airworthiness certificate. If the aircraft is one for which no records are available, the Agency will have to use collateral evidence to fix the date of manufacture. However, the expected frequency of this occurrence is too low to require the date of completion to be on each identification plate. In summary, it does not appear that the possible presence or absence of a serial number or the likelihood of deterioration as a result of aging are useful standards for determining whether the date of manufacture (or completion) should be furnished. In light of the comments received, the amendment to § 45.13(a)(4), as it appeared in the Notice, is withdrawn, and the requirement of former § 45.13(a)(4) is deleted. Subsequent subparagraphs are renumbered accordingly.

A comment suggested that the rule be revised to eliminate the requirement that the manufacturer number his aircraft in the sequence of production. This amendment does not prescribe any particular pattern or sequence of assigned numbers.

The Agency appreciates the cooperative spirit in which these comments were submitted by the public.

In consideration of the foregoing, Parts 21 and 45* are amended as follows effective July 7, 1967.

These amendments are issued under the authority of sections 307(c), 313(a), 601 and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1348(c), 1354(a), 1421 and 1423).

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*Part 45 is published separately.

Amendment 21-14

Export Airworthiness Approval Procedures

Adopted: February 10, 1967 **Effective: February 16, 1967**

(Published in 32 F.R. 2999, February 17, 1967)

The purpose of this amendment to § 21.325 of the Federal Aviation Regulations (FARs) is to remove the restriction on the issuance of export airworthiness approvals for new, small airplanes (those having a maximum certificated takeoff weight of 12,500 pounds or less) that are type certificated under Part 4a of the Civil Air Regulations (CARs).

As pertinent here, § 21.325(b)(1) states that export airworthiness approvals may be issued for an airplane type certificated under Part 23 and manufactured under a production certificate without that aircraft having been assembled and flight tested.

The export airworthiness approval regulations were originally proposed as part of the Civil Air Regulations. At that time it was determined that small, type certificated airplanes manufactured under a production certificate, as distinguished from large, complex airplanes, could be excepted from the general assembly and flight-test conditions on which the approvals were to be based. However, since there were no small airplanes type certificated under Part 4a of the Civil Air Regulations then in production, the exception was considered only in terms of small airplanes type certificated under Part 3 of the Civil Air Regulations. Moreover, since the rules governing export airworthiness approvals did not become effective until after Part 3 of the Civil Air Regulations had been recodified as Part 23 of the Federal Aviation Regulations, the exception from the assembly and flight-test requirements was stated as applicable to FAR Part 23 airplanes.

It now appears that at least two small airplanes type certificated under Part 4a of the Civil Air Regulations are currently in production. In this connection, Champion Aircraft Corporation, a manufacturer of such an airplane, has petitioned for an amendment to § 21.325(b)(1) to permit the issuance of an export airworthiness certificate for aircraft type certificated under Part 4a of the Civil Air Regulations and manufactured under a production certificate without the necessity of having to assemble and flight-test the aircraft.

As previously indicated, at the time that the current regulation was under consideration, there was no need to refer to airplanes type certificated under Part 4a. Nevertheless, the reasons for excepting new airplanes type certificated under Part 23 and manufactured under a production certificate from the assembly and flight-test requirements are equally applicable to new Part 4a airplanes manufactured under a production certificate. Therefore, in view of the current production activity with respect to small airplanes type certificated under Part 4a, it is considered appropriate to amend the regulation as requested.

Since this amendment removes an unnecessary restriction and imposes no additional burden on any person, notice and public procedure hereon are unnecessary and the amendment may be made effective on less than 30 days' notice.

In consideration of the foregoing, § 21.325(b)(1) of the Federal Aviation Regulations is amended, effective February 16, 1967.

This amendment is made under the authority of sections 313(a), 601 and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421 and 1423).

Amendment 21-15

Miscellaneous Powerplant Design Requirements for Aircraft Engines and Propellers

Adopted: February 24, 1967 **Effective: April 3, 1967**

(Published in 32 F.R. 3733, March 4, 1967)

This amendment adds miscellaneous powerplant design requirements for aircraft engines and propellers, and withdraws certain proposals for rotorcraft. This amendment is based on, and reflects industry comments concerning, Notice of Proposed Rule Making 66-3, published in the Federal Register (31 F.R. 2485) on February 8, 1966. Except as modified by the following discussion, the reasons for this amendment are those in the Notice. Changes from the Notice, and Agency disposition of industry comments, are as follows.

As proposed in the Notice, Part 21 is amended to make editorial changes consistent with the new definitions of engine power or thrust values in terms of "ratings". No substantive change results. The Notice proposed to delete § 33.13 and § 35.15 since § 21.21 contains similar general language concerning unsafe features of engines and propellers. One comment objected, stating that repetition may be beneficial in this case. The Agency disagrees. Experience has shown that repetition of legal requirements can lead to misunderstanding and uncertainty on the part of the users of the regulations. Other comments stated that §§ 33.13 and 35.15 should not be deleted because type certification standards (as opposed to procedural requirements) should be located together in one document for each product (Parts 33 and 35, respectively), and that §§ 33.13 and 35.15 also contain testing requirements not in § 21.21. The Agency agrees. This amendment therefore accomplishes the intent of the Notice by eliminating the surplus requirement with respect to engines and propellers in § 21.21 rather than by deleting the similar provision in Parts 33 and 35.

In consideration of the foregoing, Subchapters A (Part 1*) and C (Parts 21, 33, and 35*) of Chapter I of Title 14 of the Code of Federal Regulations are amended, effective April 3, 1967.

These amendments are issued under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423).

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*Parts 1, 33, and 35 are published separately.

Unnumbered Amendment

Technical Amendments to Reflect Transition to Department of Transportation

Adopted: April 4, 1967 **Effective: April 1, 1967**

(Published in 32 F.R. 5769, April 11, 1967)

The purpose of these amendments is to make changes in the Federal Aviation Regulations that are necessary because of the taking effect of the Department of Transportation Act (49 U.S.C. 1651 et seq.) on April 1, 1967. On April 1, 1967, the Federal Aviation Agency became the Federal Aviation Administration in the Department of Transportation, and the aviation safety functions of the Civil Aeronautics Board under Titles VI and VII of the Federal Aviation Act of 1958 were transferred to the National Transportation Safety Board.

This rule-making action therefore changes the term "Federal Aviation Agency", wherever it occurs in the Federal Aviation Regulations, to "Federal Aviation Administration", and the word "Agency" when used alone to denote the Federal Aviation Agency to "FAA". For reasons of economy the editions of these regulations that are currently for sale will not be reprinted merely to make these changes. Whenever they are reprinted for other reasons, the printing changes will be made. However, the pages of Part 1 reflecting the changes in definition of the term "Administrator" and the abbreviation "FAA" will be reprinted as soon as possible.

The changes made in the Parts containing references to the Civil Aeronautics Board that are affected by the transfer of functions to the National Transportation Safety Board are self-explanatory. Pages containing these changes will also be reprinted as soon as possible.

Notice and public procedure thereon are not required since these amendments merely reflect changes of law, and they may therefore be made effective immediately.

In consideration of the foregoing, the Federal Aviation Regulations (14 CFR Chapter I) are amended, effective April 1, 1967.

These amendments are made under the authority of sections 3(e), 6(c) and 9(f) of the Department of Transportation Act (15 U.S.C. 1652(e), 1655(c), 1657(f)) and section 313(a) of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a)).

Amendment 21–16

Crashworthiness and Passenger Evacuation Standards; Transport Category Airplanes

Adopted: September 15, 1967 **Effective: October 24, 1967**

(Published in 32 F.R. 13255, September 20, 1967)

The purpose of these amendments is to improve the emergency evacuation equipment requirements and operating procedures for transport category airplanes.

These amendments are based on a notice of proposed rule making (31 F.R. 10275, July 29, 1966), circulated as Notice No. 66-26 dated July 26, 1966, and on a supplement to notice of proposed rule making (31 F.R. 11725, Sept 7, 1966), circulated as Notice No. 66–26A dated September 2, 1966.

Numerous comments were received in response to Notice 66-26 and supplemental Notice 66–26A. Based upon these comments and upon review within the FAA, a number of changes have been made to the proposed rule. Most of these changes involve rewording and reorganization for greater clarity and consistency. However, certain substantive changes have been made to the proposed regulation that do not require compliance for periods of from 1 to 2 years. While all but a few of these changes fall within the scope of Notices 66-26 and 66-26A, interested persons have not been given the opportunity to comment on the details of the requirements. The issuance of a supplemental notice of proposed rule making to solicit comments upon these was considered. However, comments from the public on the original notices and from within the FAA indicated that the further delays attendant to this course of action would not be in the best interest of those concerned. Consequently, the FAA is issuing a final rule to allow the persons affected by these regulations to proceed with the certification or retrofitting of their airplanes without further delay. Thereafter, the FAA will consider comments on the changes referred to above received from interested persons on or before October 24, 1967, and may further amend the regulations in the light of these comments. The FAA believes that this course of action is justified and is in the best interest of the public.

The amendments incorporated herein are aimed at increasing substantially the probability of occupant survival in an aircraft accident. The FAA will consider additional revisions of the regulations, as advances in the state-of-the-art allow, in order to further increase that probability of survival. To this end, Government and industry development programs have been established to devise new techniques, designs, and equipment. In progress now are developments on: More effective self-extinguishing characteristics for aircraft interior materials; cabin fire suppressant systems; protection from smoke and fumes; gelled fuels; improved emergency lighting and exit conspicuity; and improved evacuation facilities and techniques.

The final amendments and the more pertinent of the comments received in response to the notices are set forth hereinafter.

Part 21

Sections 21.17 and 21.101 are amended as proposed to accommodate the special retroactive requirements incorporated by new § 25.2.

In consideration of the foregoing, Parts 21, 25, 37, and 121 of the Federal Aviation Regulations are amended effective October 24, 1967. (Secs. 313(a), 601, 603, and 604 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, and 1424)).

Amendment 21–17

Conformity of Products to Their Type Designs

Adopted: October 23, 1967 **Effective: January 26, 1968**

(Published in 32 F.R. 14925, October 28, 1967)

The purpose of this amendment to Part 21 of the Federal Aviation Regulations is to specify the showing of conformity to type design data that must be made before an aircraft or part thereof may be presented for type certification tests, and to set forth the requirements applicable to the issuance of a standard airworthiness certificate for certain aircraft not built under a type or production certificate.

This amendment is based on a Notice of Proposed Rule Making (Notice 66–21) published in the Federal Register on June 8, 1966 (31 F.R. 8075).

One of the comments received in response to the Notice expressed concern that the proposed change to § 21.33(a) might be interpreted as requiring that all aircraft presented for a flight test must completely conform to the type design. It was pointed out that under present practice, aircraft that do not fully conform to the type design but which, to the satisfaction of all FAA personnel involved, sufficiently conform to achieve the necessary test results and which have been determined by the FAA to be safe for flight, may be tested.

While complete conformity is, of course, desirable, the FAA recognizes that conformity to all the type design data at any given point during a test program may not be possible in all cases. Therefore, the proposed regulation expressly provided for deviations where authorized by the Administrator. This is consistent with the present practice and assures that the FAA is made aware of the extent to which an aircraft or part thereof does not conform to the submitted type design data prior to testing.

Contrary to the views expressed in one of the comments, the proposed change to § 21.33(a) is not directed to manufacturers producing aircraft under type or production certificates. The proposal is concerned with conformity of aircraft prior to testing during the type certification program and not with the conformity of production aircraft. Moreover, there is no change to the present procedures governing the approval of engineering changes and drawings by a Designated Engineering Representative (DER) during type certification intended under this amendment.

Another comment concerned the proposal to delete the word "flight" in § 21.33(a) to make it clear that each applicant must allow the Administrator to make any tests, ground or flight, necessary to determine that an aircraft meets the applicable requirements. In this connection, it was suggested that rather than delete the word "flight" it would be more appropriate to refer to both "flight" and "ground" tests. The FAA sees merit in this suggestion and the proposal has been changed accordingly.

One of the comments received questioned the need for the amendments concerning the statements of conformity on the grounds that the present FAA Form 317 contains the same detail as that proposed. However, contrary to this commentator's understanding, the present FAA Form 317 does not contain all the details concerning statements of conformity proposed in Notice 66–21. Moreover, even though the FAA Form 317 has been revised to accommodate the proposal, the FAA considers that the requirements concerning the statements of conformity should be set forth in the FARs.

Numerous comments were received objecting to the proposed amendment to § 21.183 in the belief that it was designed to change the present requirements concerning the certification of modified "surplus military helicopters". These comments invariably requested the retention, of the present rules insofar as the airworthiness certification of such surplus military aircraft is concerned. As expressly pointed out in the preamble to Notice 66–21, it is not the intent of the FAA to change the regulations governing the airworthiness certification of aircraft which were used in military service and later released for civil use. Surplus military aircraft are currently covered under § 21.183(d) and the proposal would merely redesignate paragraph (d) as paragraph (e) without any change to the substantive provisions of that paragraph. On the other hand, the FAA did propose to add a new paragraph (c) to § 21.183 applicable to aircraft built from spare and surplus parts. Such aircraft are currently being certificated in accordance with the broad provisions of paragraph (d) of § 21.183 which merely requires evidence that the aircraft conform to a type design. However, since aircraft built from spare and surplus parts may, in many cases, be built entirely outside of any approved system designed to ensure conformity, the FAA believed that the industry should have the benefit of a more definitive regulation when applying for certification of such aircraft. For this reason, a new paragraph (c) was proposed describing in detail the kind of evidence needed to show conformity of an aircraft built from spare and surplus parts to a type design. This proposal was issued in the belief that aircraft built from spare and surplus parts are sufficiently definable as a class to differentiate them from the other aircraft covered under the proposed new paragraph (e). However, such is not the case. From the comments received in response to the Notice, it is apparent that considerable confusion exists concerning the applicability of the proposed new paragraph (c), particularly with respect to aircraft obtained as surplus from the military, but modified for commercial use by the incorporation of spare and surplus parts. For the foregoing reasons, the FAA is aware that adoption of this aspect of the proposal would not be appropriate at this time. However, as the Notice pointed out, the FAA is currently administering the detailed procedures set forth in the proposal under the broad requirements of paragraph (d) of the present rule. There was no intent to change these detailed procedures and since, as the Notice stated, they are necessary to provide the same degree of assurance of conformity to approved type design data as is now provided for aircraft individually produced under a type certificate only, they will continue to be administered in appropriate cases under the requirements of paragraph (d).

In addition to the foregoing, the provisions of paragraphs (a) and (b) of § 21.183 are amended as proposed to make it clear that they apply to newly manufactured aircraft. Paragraph (a) is also amended to make it clear that the Administrator's power to inspect the aircraft is not limited to inspections for conformity to type design but includes inspections to determine condition for safe operation. Paragraph (b) is also amended as proposed to make it clear that the statement of conformity referred to is the same statement of conformity prescribed in § 21.130 and, as such, must be submitted by the holder or licensee of the type certificate.

As proposed in the Notice, § 21.53 required each applicant for a type certificate to submit a statement of conformity for each aircraft presented to the Administrator for tests. On the other hand, the proposal also required an applicant for a supplemental type certificate (STC) to meet § 21.53 with respect to each change in the type design. Thus, the proposal could be read as requiring that an applicant for an STC must, with respect to each and every change in the type design of an aircraft, submit a statement of conformity for the entire aircraft. This was not intended by the FAA, and the requirements of § 21.53 have been changed to make it clear that the statement of conformity is required for each aircraft or part thereof presented to the Administrator for tests.

In response to comments received, the requirements set forth with respect to import aircraft have been changed to refer to "standard" airworthiness certificates rather than "original" airworthiness certificates to make them consistent with the other requirements of that section.

In connection with the proposal to amend the supplemental type certification (STC) requirements, one comment expressed the opinion that the proposed rules would prohibit changes to an aircraft between the time that the statement of conformity governing the

STC modification is submitted and the time that the appropriate tests are performed. Actually, the proposal is concerned only with changes between the time that a showing of compliance with the appropriate design data is shown and the time the aircraft is presented for tests. Under the proposal, the statement of conformity need not be submitted until the time for conducting the necessary tests has been established. Therefore, there need not be any appreciable lapse of time between the submission of the statement of conformity and the date the FAA tests are conducted.

Other minor changes of an editorial or clarifying nature have been made. They are not substantive and do not impose an additional burden on any person.

Interested persons have been afforded the opportunity to participate in the making of this amendment. All relevant material submitted has been fully considered.

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423).

> NOTE: The recordkeeping and reporting requirements contained herein have been approved by the Bureau of the Budget in accordance with the Federal Reports Act of 1942.

In consideration of the foregoing, Part 21 of the Federal Aviation Regulations is amended effective January 26, 1968.

Amendment 21-18

Delegation Option Authorization

Adopted: November 1, 1967 **Effective: November 1, 1967**

(Published in 32 F.R. 15472, November 7, 1967)

The purpose of this amendment is to clarify Part 21 of the Federal Aviation Regulations with respect to the authority of delegation option manufacturers to issue airworthiness certificates.

Present § 21.273(a) limits a manufacturer holding a delegation option authorization to the issuance of standard airworthiness certificates for aircraft produced by him under his authorization. The word "standard" was inadvertently incorporated into § 21.273(a) during the adoption of Amendment 21-5 to the delegation option procedures. The provisions of § 21.251 covering the limits of applicability for delegation option authorizations contain no such limitation and the delegation option manufacturers have been issuing airworthiness certificates other than standard certificates for many years without any adverse effect on safety. For these reasons, the FAA considers it appropriate to correct the provisions of § 21.273(a) to make it clear that delegation option manufacturers are not limited to the issuance of standard airworthiness certificates.

Since this amendment is clarifying in nature and imposes no additional burden on any person, Notice and public procedure thereon are unnecessary and the amendment may be made effective immediately.

This amendment is made under the authority of sections 313(a), 314, 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1355, 1421, and 1423).

In consideration of the foregoing, § 21.273(a) of Part 21 is amended effective November 1, 1967.

Amendment 21-19

Issue of Special Conditions

Adopted: December 7, 1967 **Effective: January 12, 1968**

(Published in 32 F.R. 17850, December 13, 1967)

The purpose of these amendments is to clarify the status of special conditions issued during type certification of aircraft, aircraft engines, and propellers, and to prescribe the procedures for their issuance.

These amendments are issued for the reasons set forth in the Notice of Proposed Rule Making published in 32 F.R. 6098 on April 18, 1967, and circulated as Notice 67-16 dated April 12, 1967. The comments received in response to the Notice and the changes in the proposal resulting therefrom are discussed below.

In response to a comment on the Notice, §§ 21.16 and 21.101 now refer to "adequate" safety standards rather than "complete" safety standards. The FAA agrees that this minor change is appropriate to remove any implication that special conditions are designed to raise the level of airworthiness for a product beyond the minimum which has been generally set by the applicable existing regulations. In addition, this proposal has been revised to make it clear that special conditions apply to a novel or unusual design feature not otherwise covered by the existing regulations.

The FAA, however, has not adopted a recommendation to revise the proposal to expressly state that the Administrator prescribe "minimum" special conditions. The FAA does not consider that this change is necessary since the regulation specifically provides that the Administrator prescribes such special conditions as may be necessary to establish a level of safety equivalent to that established in the existing airworthiness regulations.

Another comment stated that under present practice, the FAA and the manufacturer resolve, through negotiation, any problems that may arise from special conditions. The comment stated that the proposed rules should specifically recognize and provide for this need. In this connection it should be noted that the Administrative Procedure Act (APA) requires that all persons subject to a rule, such as a special condition, must be given notice thereof and an opportunity to participate in the rule making. As pointed out by the commentator, in the past special conditions have been developed only after extensive consultation with the interested persons. This informal procedure represents an effective and practical means of providing the notice and opportunity to participate that is required in rule-making actions by the APA and it will be continued. The proposal has been changed to expressly acknowledge that the manufacturer of a product is afforded the opportunity to participate in the formulation of special conditions applicable to his product. Moreover, for purposes of clarification, the final rule elaborates on the term "private rule" as used in the proposal by specifying that special conditions are issued to an applicant for a type certificate as rules of particular applicability for his product.

Finally, a suggestion was made that the proposal should also allow the Administrator to relieve an applicant from regulations deemed burdensome and not relevant in particular cases. While this comment is outside the scope of the proposal, it should, nevertheless, be pointed out that the suggested change is unnecessary. The current regulations governing type certification require compliance only with the applicable airworthiness regulations and expressly provide for noncompliance with any airworthiness regulation whenever equivalent safety is provided. Irrelevant regulations are thus excluded from the certification basis for a product during the certification process. In some instances this has been reflected in special conditions.

Interested persons have been afforded the opportunity to participate in the making of these amendments. All relevant material submitted has been fully considered.

These amendments are issued under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421, and 1423).

In consideration of the foregoing, Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended effective January 12, 1968.

Amendment 21-20

Issue of Airworthiness Certificates for Certain Normal, Utility, Acrobatic, and Transport Category Aircraft

Adopted: February 9, 1968 **Effective: March 17, 1968**

(Published in 33 F.R. 3054, February 16, 1968)

The purpose of this amendment to § 21.183(d)(2) is to add performance standards, and permit more persons to qualify, with respect to the airworthiness inspection conducted on certain aircraft by private persons prior to the Administrator's inspection for the issue of an airworthiness certificate for such aircraft.

This amendment is based on a Notice of Proposed Rule Making (Notice 67–33) published in the Federal Register on July 28, 1967 (32 F.R. 11042).

Most comments supported the proposal. However, one commentator agreed provided the level of safety upon which this amendment is based is assured by including details for the 100-hour inspection for particular airplanes. As indicated in the provisions of Part 43, the detailed performance requirements set forth in that Part for the 100-hour inspection are sufficiently broad to provide a basis for determining that any aircraft inspected in accordance with those requirements is in an airworthy condition. Therefore, there should be no derogation of safety when inspections of the same scope are conducted under § 21.183(d)(2). It should be noted that the inspection conducted under § 21.183(d)(2) provides one source of information that the Administrator, after inspection, may use in making his determination, under § 21.183(d)(3), as to whether the aircraft conforms to the type design and is in condition for safe operation. For this purpose, as stated in the Notice, an inspection of the scope of a 100-hour inspection as outlined in Part 43 of the Federal Aviation Regulations would provide the necessary information.

One comment stated that a mechanic with airframe and powerplant ratings should not be permitted to perform the inspection under § 21.183(d)(2) because he does not have the maintenance organization possessed by air carriers, manufacturers, or repair stations for conducting the required inspection. The FAA disagrees. Section 43.13(a) requires each person performing maintenance to use any tools, equipment, and test apparatus necessary to assure completion of the work in accordance with accepted industry practice, including any special equipment recommended by the manufacturers (or its equivalent acceptable to the Administrator). This rule covers required inspections as well as other maintenance. The FAA has no reason to believe that this rule is not adequate for certificated mechanics conducting 100-hour inspections. This amendment simply incorporates the scope of the 100-hour inspection of Part 43 into the required inspection provisions of § 21.183(d)(2). This comment cannot, therefore, be accepted.

With respect to certificated mechanics, the Notice proposed to limit the inspection privilege to mechanics who hold "both airframe and powerplant ratings." This would have prevented mechanics who hold only one of those ratings from conducting an inspection, of the scope of the 100-hour inspection requirements of § 43.15, on that portion of the aircraft covered by their single rating. This exclusion would conflict with §§ 65.85 and 65.87, which together permit the holders of airframe ratings to perform 100-hour inspections on airframes and permit the holders of powerplant ratings to perform 100-hour inspections on powerplants, propellers, or any part thereof. Since this amendment simply incorporates the scope of the 100-hour inspection requirements of Part 43 into the required inspection provisions of § 21.183(d)(2), there is no valid reason to require that a certificated mechanic must hold both ratings in order to perform the inspection prescribed under this amendment. Rather than referring to "both" ratings, new § 21.183(d)(2)(iii) therefore simply refers to all holders of mechanic certificates "as authorized by Part 65 of this chapter" (which includes §§ 65.85 and 65.87).

One comment suggested that the rule be amended to permit the persons who make the airworthiness inspection to also conduct the conformity check required under § 21.183(d)(1). While this comment goes beyond the scope of Notice 67–33, it will be given consideration for possible future rule-making action.

Interested persons have been afforded the opportunity to participate in the making of this amendment. All relevant material submitted has been fully considered.

In consideration of the foregoing, § 21.183(d)(2) of Part 21 of the Federal Aviation Regulations is amended effective March 17, 1968.

These amendments are made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421 and 1423).

Amendment 21-21

Special Airworthiness Certificates

Adopted: April 30, 1968 **Effective: June 6, 1968**

(Published in 33 F.R. 6856, May 7, 1968)

The purpose of these amendments is to provide for a classification of special airworthiness certificates that includes restricted, limited, provisional, and experimental certificates, and special flight permits; to expand the purposes for which experimental certificates may be issued to include market surveys, sales demonstrations and customer crew training operations; and to expand the purposes for which special flight permits may be issued. The general operating and flight rules are also amended to include operating limitations applicable to aircraft having experimental certificates.

These amendments are based on a Notice of Proposed Rule Making (31 F.R. 9131, July 2, 1966), circulated as Notice No. 66-24, dated June 27, 1966.

Numerous comments were received in response to Notice 66-24. Based upon these comments and upon further consideration by the FAA, a number of substantive changes have been made to the proposed rules. The comments received and the changes in the proposal resulting therefrom are discussed below.

In addition to the proposed regulations concerning special airworthiness certificates, Notice 66-24 contained detailed proposals setting forth comprehensive airworthiness standards for amateur-built aircraft. However, the comments received in response to the amateur-built aircraft rules were consistently opposed to the proposal. In the light of these comments and after further study by the FAA, it is apparent that detailed substantive changes to the proposed standards will be necessary in order to provide meaningful airworthiness standards for amateur-built aircraft. Therefore, the FAA intends to issue a new Notice of Proposed Rule Making proposing airworthiness standards for amateur-built aircraft taking into consideration the comments received on Notice 66-24. For this reason, those portions of Notice 66-24 dealing with the issuance of special type and airworthiness certificates for amateur-built aircraft and proposing new airworthiness standards for such aircraft are withdrawn.

The proposal would also have changed the present requirements concerning provisional airworthiness certificates to delete the provisions covering the issuance of Class I provisional type and airworthiness certificates. At the same time, it was proposed to permit market surveys and sales demonstrations under an experimental certificate. Comments received concerning this proposal indicate, however, that there are situations in which manufacturers would not want to conduct such operations in aircraft having experimental certificates. The comments suggest that the requirements for Class I provisional certificates should be retained and the manufacturer permitted to use either an experimentally certificated aircraft or a Class I provisionally certificated aircraft in conducting these operations. The FAA sees merit in this suggestion and the proposal has been changed accordingly. The comments also pointed out that customer crew training is permitted under a Class I provisional certificate and that this should also be permitted under an experimental certificate. The FAA intended to extend to manufacturers the same privileges under the experimental certificate as they have under the Class I provisional certificate. This privilege has been extended to manufacturers through numerous exemptions without any adverse effect on safety. The proposal has therefore, been changed to expressly permit customer crew training by manufacturers under an experimental certificate.

As previously indicated, one of the objectives of Notice 66-24 was to provide for the classification of airworthiness certificates as either standard or special. In this connection, detailed amendments were proposed to the airworthiness certification provisions in Part 21 primarily for the purpose of classifying restricted and limited category airworthiness certificates, provisional and experimental airworthiness certificates and special flight permits, as special airworthiness certificates. The detailed changes, particularly with respect to format, proposed in Notice 66-24 to accommodate the new classification were considered appropriate in view of the extensive revisions to the regulations that were being made to implement the proposed new certification standards for amateur-built aircraft and to accommodate the proposed new provisional certification requirements. However, in view of the decision concerning these two matters as referred to above, and in the light of the numerous comments received in response to this Notice, the FAA does not consider that an amendment of the regulations to the extent proposed is necessary in order to accomplish the objective of the proposal with respect to special airworthiness certificates. In this connection, section 21.175 covering the classification of airworthiness certificates has been amended merely to indicate that airworthiness certificates are classified as either standard or special and that special airworthiness certificates include airworthiness certificates issued for restricted, limited and provisionally certificated aircraft, experimental certificates and special flight permits. Thus, contrary to the proposal, the final rules do not contain amendments to the sections of Subpart H of Part 21 concerning the issue of airworthiness certificates for normal, utility, acrobatic and transport category aircraft; the issue of airworthiness certificates for restricted and limited category aircraft and the issue of multiple airworthiness certificates. Moreover, no changes are being made to the provisional airworthiness certification requirements. The only changes being made concern the issue of experimental certificates and special flight permits.

In Notice 66-24, the FAA proposed to change the requirement in § 21.179 to provide that experimental certificates and special flight permits are not transferred with an aircraft. Several comments concerning this proposal pointed out the disadvantages in making such a restriction applicable generally to all experimentally certificated aircraft. The comments were particularly concerned with amateur-built aircraft. The proposed change was initiated in the belief that because of the operations covered by experimental certificates and special flight permits and the aircraft involved, each owner of the aircraft should identify his need for the certificate and show that the aircraft can be operated safely. However, it has subsequently been determined that the safety of operations in aircraft having experimental certificates and special flight permits is adequately covered by the limitations imposed under the current regulations, including the limitation on the duration of such certificates and permits and that the proposed restriction is unnecessary in the interest of safety.

In order to consolidate the provisions governing the duration of airworthiness certificates, the duration provisions applicable to experimental certificates presently set forth in § 21.195 have been incorporated into § 21.181. Finally, the purposes for which experimental certificates are issued as set forth in § 21.191, have been expanded consistent with the proposal to permit market surveys, sales demonstrations and customer crew training as well as training of the applicant's flight crews to be conducted in experimentally certificated aircraft. However, while the proposal would have required the applicant for an experimental certificate for an aircraft to be used in market surveys, sales demonstrations and customer crew training operations to, among other things, show that the aircraft had been flown for at least 50 hours, in response to comments received the proposal has been changed to require that the aircraft need have been flown for only 5 hours if it is a type certificated aircraft which has been modified.

With respect to special flight permits, Notice 66-24 contained a proposal providing for the issue of special airworthiness certificates for those operations currently authorized under special flight permits. In this connection, production flight tests would have been authorized as an experimental purpose under a special airworthiness certificate and the other operations presently covered by special flight permits would have been authorized under a special airworthiness certificate for aircraft involved in ferry flights. Various comments were received concerning this proposal, particularly with respect to the fact that as proposed, production flight testing would have been identified as an experimental operation. This, of course, is not appropriate. Therefore, in the light of these comments and after further consideration, the FAA has determined that these changes are not necessary. However, as proposed, the requirements governing special flight permits now provide for the issuance of special flight permits for the purpose of evacuating aircraft from areas of impending danger and incorporate the proposed changes to the information required to be submitted by the applicant for a special flight permit.

A comment was also received concerning the provision in the Notice prohibiting the carriage of persons or property for compensation or hire in aircraft having a special airworthiness certificate. The comment stated that there is no justification, on the basis of safety, for prohibiting the carriage of property for compensation or hire. As set forth in Notice 66-24, the special airworthiness certificate classification covers restricted and limited category certificates, experimental certificates and special flight permits. In this connection, the Notice did not propose a new requirement but merely restated the current limitation on the carriage of persons or property for compensation or hire applicable to aircraft having such certificates. A general authorization to carry property for compensation or hire on aircraft certificated in the limited or restricted category or on aircraft having experimental certificates and special flight permits would be inconsistent with the limitations set forth in the special purpose for which those certificates may be issued and would require regulatory changes beyond the scope of Notice 66-24.

With reference to airworthiness certificates in general, various comments objected to the proposed requirement that applications for an airworthiness certificate be submitted to the local FAA office. As the comments indicated, the FAA is aware that in some instances the "local" FAA office may not be as accessible to an applicant as the District Office of another Region. Therefore, to prevent unnecessary inconvenience in the submittal of applications, the FAA agrees with one of the comments that applications should be submitted to any FAA office and the rule has been changed accordingly. In addition, in response to comments, the proposal has been revised to take into consideration the current practice of accepting telephone and telegraphic applications for special flight permits in emergency situations.

A proposal to change the requirements of § 45.23 to require that aircraft having special airworthiness certificates display the word "special" near each entrance to the cabin or cockpit was also included in Notice 66-24. However, based on the numerous comments on this proposal and after further consideration, the FAA has determined that the proposed change would not accomplish the objective sought and could create confusion as to the nature of the aircraft. Therefore, § 45.23 remains unchanged and limited, restricted, experimental or provisionally certificated aircraft must still display the words "limited", "restricted", "experimental" or "provisional airworthiness", as the case may be.

In light of the determinations concerning the proposed changes to Part 21, the only amendment to Part 91 now considered necessary is the proposed amendment setting forth operating limitations applicable to aircraft having experimental certificates. These operating limitations are set forth in new § 91.42. In this connection, several comments were received objecting to the area restrictions proposed for aircraft having experimental certificates. The comments pointed out that the FAA recently amended Part 91 to delete the requirements concerning "approved" flight test areas and that there appears to be no reason for requiring operation in "approved" areas under the proposed rule. The operating limitations set forth herein are applicable to all aircraft having experimental certificates and not just aircraft involved in flight tests. The FAA considers that all aircraft having experimental certificates must, in the interest of safety, be operated in an area assigned by the Administrator until it is shown that the aircraft is controllable throughout its normal range of speeds and throughout all the maneuvers to be executed and it is shown that the aircraft has no hazardous operating characteristics or design features. After the required showing has been made, if the aircraft is to be flight tested it would be governed by the flight test requirement of § 91.93 or if the aircraft is to be used for any of the other purposes for which an aircraft having an experimental certificate may be used, it would be governed by any area limitations particularly related to that purpose imposed by the FAA. The area restriction set forth herein has for a number of years been included in each experimental certificate issued by the FAA.

With reference to experimental certificates and special flight permits, one of the comments pointed out that the Notice made no provision for the renewal of expired certificates. The commentator recommended that the regulations either be changed to provide that experimental certificates remain in effect as long as maintenance is performed in accordance with Parts 43 and 91 of the Federal Aviation Regulations or to specify requirements applicable to the renewal of such certificates. In this connection, it was recommended that an experimental certificate should be renewed when the applicant has submitted (1) a statement that the aircraft is to be operated for one or more of the experimental purposes and, (2) upon inspection of the aircraft by the Administrator any other information necessary for the purpose of prescribing operating limitations. In most cases, Part 43 of the Federal Aviation Regulations is not applicable to aircraft having experimental certificates and this is pointed out in the applicability section of that Part. Therefore, the duration of experimental certificates cannot be predicated on compliance with the maintenance requirements of Part 43. However, since under the current regulations, experimental certificates remain in effect for no longer than one year, there appears to be merit in the recommendation for regulations covering the renewal of such certificates and the FAA plans to give the commentators recommendation further consideration with a view to appropriate regulatory action.

In Notice 66-24, it was proposed to change the current regulations by restricting the issuance of experimental certificates for aircraft to be used for air racing to those air races which are officially sanctioned. However, in the light of the comments on this proposal and after further consideration, the FAA does not consider that the proposed requirement is necessary in the interest of safety. Any participant in an air race must comply with the air traffic and general operating rules set forth in Part 91 of the FARs regardless of whether that air race is sanctioned by the organizations referred to in the Notice. Moreover, the FAA is not aware that operations conducted under the current requirements have had any adverse effect on safety. For this reason the proposed restriction has not been adopted.

A number of comments were received concerning the absolute prohibition on the operation of aircraft having experimental certificates with respect to populated areas and congested airways. The comments pointed out that the proposed operating limitations would severely curtail current operations with aircraft having experimental certificates since the base of operations may be an airport in a populated area used for private and commercial operations. The FAA considers that the comment has merit and that an appropriate revision of the proposed requirement may be made without any adverse effect on safety. In this connection, the proposal has been changed to prohibit aircraft having experimental certificates from being operated over densely populated areas and in congested airways, except for takeoffs and landings conducted in accordance with special operating limitations issued by the Administrator. This provides the necessary relief and parallels the limitation on the operation of restricted category aircraft currently set forth in the regulations. In addition, the proposed operating limitations have been revised to make it clear that notice of the experimental nature of the aircraft is required only when operating into and out of airports with operating control towers. While there were comments objecting to this limitation, the FAA believes that the traffic controller should be made aware of the experimental status of an aircraft so that special instructions with regard to the usage of runways or approach patterns can be applied if necessary in the interest of safety.

Interested persons have been afforded an opportunity to participate in the making of these amendments. All relevant material submitted has been fully considered.

In consideration of the foregoing, Parts 21 and 91* of the Federal Aviation Regulations (14 CFR Parts 21 and 91) are amended, effective June 6, 1968.

These amendments are issued under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421, and 1423).

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*Part 91 is published separately.

Amendment 21-22

Issuance of Special Flight Permits with Continuous Authorization to Conduct Ferry Flights

Adopted: August 15, 1968 Effective: September 21, 1968

(Published in 33 F.R. 11900, August 22, 1968)

The purpose of these amendments to Parts 21 and 91 of the Federal Aviation Regulations is to provide for issuance by the Administrator of special flight permits with continuing authorization to conduct ferry flights, for specified purposes, to an air carrier or commercial operator of large aircraft certificated under Part 121 or an air carrier engaged in scheduled operations with helicopters certificated under Part 127.

These amendments are based on a Notice of Proposed Rule Making published in the Federal Register on October 25, 1967 (32 F.R. 14775). Interested persons were afforded an opportunity to participate in the rule making through submission of written comments. Due consideration has been given to all relevant matter presented.

Comment received in general supported the proposed amendments, since they afford a savings in time and paper work and contribute to the efficient utilization of equipment.

The Air Line Pilots Association (ALPA) was opposed to the proposed amendments on the grounds that the operation of unairworthy airplanes compromised safety and therefore was not in the public interest. The objection of the ALPA extended to the issuance of individual special flight permits as well as issuance of special flight permits with continuing authorization to conduct ferry flights.

Permitting the flight of aircraft which may not currently meet with all applicable airworthiness requirements for the purpose of accomplishing necessary maintenance or alterations is a practice of long standing, and FAA experience with this practice does not indicate that safety has been compromised. It is the judgment of the FAA that such flights are frequently advantageous and may be safely conducted under carefully selected operating conditions and appropriate restrictions.

The Air Transport Association of America (ATA) expressed general agreement with the proposal and recommended certain changes. It suggested that including the flight permit and continuing authorization, together with conditions and limitations, in the certificate holder's operations specifications would greatly expand their volume, and that requiring those portions of the operation specifications to be carried in the aircraft under § 91.27 would be unnecessarily burdensome. ATA further recommended that scheduled helicopter operators certificated under Part 127 be included as eligible under § 21.197 since they have similar problems and situations requiring the ferry of aircraft for maintenance or alterations. The latter recommendation is viewed as appropriate and § 21.197 has been broadened to apply to Part 127 certificate holders as well as Part 121 certificate holders.

It is not felt that the proposed requirement for carrying applicable sections of the operations specifications abroad the aircraft would be unduly burdensome. The FAA statement of the permit with continuing authorization, together with a listing of general conditions and limitations imposed by the Administrator is expected to be brief, and should normally require no more than the addition of a single page in the operations specifications. More detailed conditions and limitations considered necessary by the permit holder to meet specific contingencies would normally be contained in operations manuals or maintenance manuals, or in the permit holder's communication which directs or authorizes the flight. However, in order to provide for greater flexibility, the requirement has been stated in the alternative in § 91.27, allowing the permit holder to carry either the operations specifications or portions of the air carrier manual required by § 121.133 or § 127.61 containing a restatement of the permit and those conditions and limitations imposed by the Administrator in the operations specifications.

The ATA recommendation that the special flight permit and continuing authorization be stated originally in the air carrier manual required under § 121.133 rather than the operations specifications has not been adopted. While a restatement of the conditions and limitations in operations and maintenance manuals will contribute to a workable arrangement, it is believed the operations specification is the appropriate place for the original statement of the special flight permit with continuing authorization, and for the original listing of general conditions and limitations for flight. The certificate holder, in restating conditions and limitations for flight in the air carrier manual, may find it convenient or necessary to supplement the listing with more detailed statements of procedures and restrictions.

It is anticipated that an advisory circular or internal FAA directive, or both, will be issued to facilitate and standardize issuance of the permits.

In consideration of the foregoing, Parts 21 and 91 of the Federal Aviation Regulations are amended effective September 21, 1968.

These amendments are made under the authority of sections 313(a), 601 and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1345(a), 1421 and 1423).

Amendment 21-23

Critical Rotorcraft Components

Adopted: September 10, 1968 Effective: October 17, 1968

(Published in 33 F.R. 14104, September 18, 1968)

The purpose of these amendments to Parts 21, 27, 29, 43, 45, 91 and 127 of the Federal Aviation Regulations is to (1) permit rotorcraft manufacturers to adopt failsafe fatigue design practices for certain portions of the flight structure on condition that related fatigue crack detection procedures and inspection intervals are approved under the required fatigue evaluation as part of the type design and placed in a separate section of the rotorcraft maintenance manual, (2) require that the replacement times of certain critical components be similarly approved and placed in the separate section of the maintenance manual, (3) require that this section of the manual be referenced by placard in the rotorcraft, and (4) specifically require operators and maintenance personnel to comply with this section of the maintenance manual. The amendments will also require manufacturers to make certain revisions of the rotorcraft maintenance manual available to operators and require identification of certain critical components.

These amendments are based on a Notice of Proposed Rule Making (Notice No. 67-44) published in the Federal Register on October 11, 1967 (32 F.R. 14106).

A number of comments were received in response to Notice No. 67-44, most of which were in agreement with the proposal. The more pertinent of the comments that raised questions together with the changes in the proposal resulting therefrom are discussed hereinafter.

In view of the new sections that were proposed, one commentator suggested that existing §§ 27.307(a) and 29.307(a) be clarified by indicating that the structural analysis used in connection with proof of structure, be permitted to be either static or fatigue. The FAA agrees that such a change would more fully express the intent of the rule yet not imply a change in past practice in which fatigue evaluation has generally involved testing. The sections have been amended accordingly.

As previously stated in the preamble of the Notice, the standards of new §§27.571, 29.571, 27.1529 and 25.1529 are intended to preserve the design objectives stated in Notice 65-42, Airframe Proposal 8, except for clarifying changes.

One commentator stated that use of the word "component" in the proposed §§ 27.571 (a) and 29.571(a) could be interpreted as meaning that the entire fuselage, for example, and most of its elements are critical so that a formal fatigue evaluation would be required to be performed on each frame, stringer, panel, or combination. However, since not all parts of a flight structure, such as the fuselage, are likely to be critical in fatigue, it was suggested that the requirement be clarified to call for evaluation only of those considered critical. The FAA is in substantial agreement for it was not intended to require detailed evaluation of a portion of the structure for which no significant fatigue loading exists. The paragraph has been amended, therefore, to delete the word "component" and indicate that it is the critical portion of the flight structure that must be identified and evaluated. A further recommendation that the paragraph be amended to be applicable to failures which "would" be catastrophic rather than those which "could" be catastrophic has been rejected since this would imply that doubtful areas need not be included in the fatigue evaluation. In connection with the requirement for fatigue evaluation of flight structure, it was suggested that the intent be clarified so as not to extend the fatigue evaluation to non-critical parts. While the FAA agrees with the objective of this comment, it is believed that the revisions to § 27.571(a) and § 29.571 (a) discussed above sufficiently delineate the applicability without introducing the new term "noncritical".

As they were proposed, §§ 27.571(a)(3)(i) and 29.571(a)(3)(i) indicated that loads and stresses need be subjected to inflight measurement only throughout the range expected in operation where such range is less than the range of design limitations stated in §§ 27.309 and 29.309. It is apparent that such a generally stated alternative is at variance with other requirements inasmuch as design weight, rpm, airspeeds, and c.g. limits are attainable without extreme maneuvers and are, in general, explored in other phases of the flight test program. With maneuvering load factors, the situation is otherwise, however, and since it would be unrealistic in connection with fatigue evaluation to require measurement of loads and stresses at the limit maneuvering load factors, the alternative of using operational rather than design limits would there be applicable. To remove any ambiguity with reference to weight, rpm, airspeed, and c.g. limits, §§ 27.571(a)(3)(i) and 29.571(a)(3)(i) have been reworded to make it clear that it is for only maneuvering load factors that inflight measurements may be made with reference to values expected in operation.

The FAA agrees with a comment that the intent of §§ 27.571(d)(2) and 29.571(d)(2) is to distinguish the lesser of the limit and maximum attainable loads rather than designate one as being applicable. The parenthetical expression in the two sections has been amended to state "whichever is less".

Pointing out that some procedures are so simple and well known that actual demonstration should not be required, one commentator objected to the requirement that all procedures in the "Airworthiness Limitations" section of the Rotorcraft Maintenance Manual be shown to be practicable. Since the need for an actual demonstration should be determined on an individual basis, the requirement for a showing has been eliminated in §§ 27.1529(a)(2)(ii) and 29.1529(a)(2)(ii).

One of the comments received in response to the Notice requested that the FAA specifically countermand the "administrative procedures" specified in the preamble. In this connection, the commentator referred to the preamble discussions in which the FAA indicated that if safety requires that the airworthiness limitations in the Rotorcraft Maintenance Manual must be made more severe, appropriate changes to the manual would be made by airworthiness directives. While the comment objected to the general use of airworthiness directives, it did indicate acceptance of telegraphic airworthness directives for use in this regard.

As pointed out in the preamble to Notice 67–44, the inspection intervals, replacement times and related procedures set forth in the "Airworthiness Limitations" section of the Rotorcraft Maintenance Manual are limitations on the original approval of the type design. Thus, any changes to these limitations are, in effect, changes to the type design. In recognition of this fact, airworthiness directives have long been used by the FAA to prescribe changes to the service life limits for a product. However, it should be made clear that since the replacement times, inspection intervals, etc., would now be placed in a maintenance manual, the manufacturer's changes to the manual and subsequent dissemination to all operators would serve the purpose originally served by airworthiness directives. However, as the FAA pointed out in the preamble discussions, in those instances where a safety necessity exists, the airworthiness directive is the means by which the FAA can assure that the operators have the revised limitations. Moreover, an airworthiness directive would also be required in those instances in which a manufacturer failed to issue revisions to the limitations which the FAA considered necessary in the interest of safety. Only in the latter instance would the FAA make changes to the manual by airworthiness directive. As the commentator correctly noted, approved revisions to the airworthiness limitations section of the maintenance manual have had the same legal effect as the original limitations and the issuance of airworthiness directives with respect to such limitations would not be inconsistent with that fact.

The FAA agrees with one final suggestion that service experience may be used in certain instances in a resubstantiation of the flight structure, as, for example, for a relaxation of a replacement time or inspection interval in the "Airworthiness Limitations" section of a Rotorcraft Maintenance Manual. It must be recognized, of course, that time extensions for parts, the failure of which would be catastrophic, cannot be based solely on failure rates or absence of failures in service. However, it is intended to permit appropriate use of service experience in reevaluating flight insurance in accordance with §§ 27.571 and 29.571. In this connection, laboratory tests might be made on parts that have been used in service to determine whether the original assumptions were overly conservative.

Interested persons have been afforded an opportunity to participate in the making of this amendment, and due consideration has been given to all matter presented.

In consideration of the foregoing, Parts 21, 27, 29, 43, 45, 91, and 127* of the Federal Aviation Regulations are amended effective October 17, 1968.

This amendment is made under the authority of sections 313(a), 601, 603, 604, and 605 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425).

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*Parts 27, 29, 43, 45, 91, and 127 are published separately.

Amendment 21–24

Designation of Applicable Regulations for Type Certificates

Adopted: January 3, 1969 **Effective: February 9, 1969**

(Published in 34 F.R. 363, January 10, 1969)

The purpose of these amendments to Part 21 of the Federal Aviation Regulations is to clarify the provisions regarding the designation of applicable regulations for the issuance of type certificates (TCs).

These amendments are based on a notice of proposed rule making (32 F.R. 17455, December 6, 1967), circulated as Notice No. 67-52, dated November 29, 1967. Numerous comments were received in response to the Notice. The FAA's disposition of these comments are set forth hereinafter.

One of the comments received stated that the substantive effect of removing the parenthetical exclusion for restricted category, import and surplus military aircraft from § 21.17(a) is unclear and requested that this proposal be withdrawn. As pointed out in the preamble to Notice 67-52, the removal of the parenthetical statement from § 21.17(a) will have no substantive effect on the type certification of the aircraft mentioned in that statement. The parenthetical exclusion merely emphasizes the fact that there are other provisions in the regulations for restricted category, import, and surplus military, aircraft which contain specific requirements concerning the airworthiness standards applicable to such aircraft. This emphasis is unnecessary, however, since § 21.17(a) already excepts an applicant for a type certificate from meeting the applicable airworthiness requirements effective on the date of application in those cases where the Administrator has specified otherwise by regulation. In this connection, specific requirements concerning the airworthiness standards applicable to restricted category, import and surplus military aircraft are set forth in §§ 21.25, 21.29 and 21.27 respectively. Moreover, in addition to being unnecessary, the parenthetical exclusion of restricted category, import and surplus military aircraft has also created some confusion as to the applicability of paragraphs (b) and (c) of § 21.17 to such aircraft. Therefore, the FAA considers it appropriate to amend the regulation as proposed and delete the parenthetical statement presently contained in § 21.17(a).

Another comment urged that the five-year limitation for certification of transport category aircraft be applied to nontransport aircraft as well. The commentator points out that some of the small aircraft of today are more complex than the transports of earlier years and more complex than some current large aircraft. While this is true, the majority of the small aircraft being built today are less complex than the aircraft being certificated in the transport category. Experience with the three-year limitation indicates that it is satisfacory as a rule of general applicability for small aircraft. On the other hand, the FAA considers that it has adequately covered the very complex small aircraft by providing for the approval of a longer type certification period upon a showing that additional time is needed.

Under the current regulations, applications for type certificates are effective for three or five years, depending upon the category of aircraft involved. In Notice 67-52, it was proposed to amend § 21.17(b) to permit longer periods if the applicant shows at the time of application that his product requires a longer period of time for design, development and testing. One of the comments objected to this proposal, stating that a period longer than the present three or five years should not be granted. The commentator stated that if a manufacturer needs extensions of the time to complete certification, such extensions should stipulate that all possible interim airworthiness requirements would be required for final certification. The FAA does not agree with this comment since it would, in effect, require the applicant for a type certificate to show compliance with the airworthiness requirements in effect on the date of issue of the type certificate. Such a requirement would be impractical. The FAA recognizes that a manufacturer must freeze his design at some point in order to establish and maintain production. It is unrealistic to expect a manufacturer to continuously incorporate the changes in its type design dictated by all amendments to the regulations that occur up to the date of certification. In those cases where safety requires that a technological advance be incorporated into an aircraft design prior to certification, the FAA has taken, and will in the future take, appropriate regulatory action to assure that this is done. However, for the purpose of the initial designation of the regulations applicable to the certification of a product, the FAA has determined that for some of the new complex aircraft and the ultralarge aircraft it may not be possible to complete certification within the prescribed three or five year periods. For this reason, the manufacturers must be given the opportunity to establish a realistic certification period on the basis of the complexity and size of the aircraft.

It was also recommended that proposed § 21.17(b) be changed to permit the applicant for a type certificate to show at any time prior to the expiration of the effective periods presently specified in the regulations, as well as at the time of application, that a longer type certification period is required. Proposed § 21.17(b) is premised on the consideration that an applicant for a type certificate will have established a firm program for the design, development, and testing of his product at the time of application and will, therefore, know at that time whether a longer certification period will be necessary. This is consistent with the current regulations which, because of the established three and five year effective periods make it necessary that a manufacturer have an established program for the design, development, and testing of his product at the time of application. If, under the current regulations, unforeseen circumstances arise after the date of application that necessitate a longer period for certification, the manufacturer is required to comply with later regulations. There is no intent to change this concept by this proposal. Therefore, the proposed regulation has not been changed as recommended. However, it should be noted that to some extent the change recommended by this comment is already reflected in the proposed regulation. In this connection, this amendment permits an applicant for a type certificate to file for an extension of his application within the period originally established for type certification and to show compliance with regulations that have an effective date later than the requirements originally imposed, but not as late as required by the current regulations.

A final comment with respect to § 21.17 recommended that the proposal should be changed to require manufacturers to comply with the applicable portions of the operating rules in effect at the time of the type certification of a product. The substantive change involved in this recommendation is, of course, outside the scope of Notice 67-52. However, it should be pointed out that since all airworthiness requirements that are appropriate for inclusion on an aircraft during the type certification process are incorporated into the appropriate airworthiness parts of the regulations at the same time that they are added to the operating rules, an aircraft will comply with all such regulations that are in effect at the time of the application for the type certificate. A different situation exists with respect to those airworthiness requirements that are made effective subsequent to the date of application for the type certificate, but prior to the date of issuance of the type certificate. For the reasons previously set forth in this preamble, the safety regulations have not required that all airworthiness standards adopted subsequent to the date of application for a type certificate be applied to an aircraft in the process of obtaining a type certificate. The regulations have, however, always provided for such an application when specified by the Administrator and, in appropriate instances, the FAA has taken regulatory action to require that existing airworthiness requirements adopted subsequent to the date of application for a type certificate be applied to an aircraft as a condition to the issuance of that certificate. The FAA considers that this is the proper procedure for dealing with the matter of retroactive application of airworthiness regulations. Since there are airworthiness requirements that are related to specific operations and are not, therefore, properly a condition to the issuance of a type certificate for an aircraft, the application of airworthiness requirements should be determined on a case-by-case basis.

With respect to import products, the FAA also proposed to amend § 21.29(a) to provide for the type certification of an import product previously granted a foreign airworthiness approval. It was proposed to permit such certification if the country of manufacture certified that the product met the applicable airworthiness requirements of the foreign country of manufacture and any other requirements prescribed by the Administrator to provide a level of safety equivalent to that provided by the applicable U.S. regulations that were in effect at the time of the original foreign airworthiness approval. At the time that Notice 67-52 was issued, the FAA was involved in the difficult process of type certificating a few old foreign aircraft, such as the Tiger Moth, under the current § 21.29. The proposed change to § 21.29 was intended to accommodate the certification of these older foreign aircraft because of their intrinsic value as antiques. It was thought that only a few people would be interested in the type certificate of foreign aircraft under the proposal. However, the proposal contained no limitations as to the size or the age of aircraft that could be certificated thereunder and it now appears that there are many large aircraft of foreign manufacture that would be available for import into the United States under this regulation. Moreover, the FAA now realizes that such aircraft could be used in air carrier and related operations. For this reason, and after further consideration, the FAA does not consider that the proposed change to § 21.29 would be in the public interest and it is withdrawn.

Interested persons have been afforded an opportunity to participate in the making of these amendments. All relevant material submitted has been fully considered.

In consideration of the foregoing, Part 21 of the Federal Aviation Regulations is amended, effective February 9, 1969.

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21–25

Type Certification and Approval

Adopted: August 28, 1969 **Effective: October 5, 1969**

(Published in 34 F.R. 14067, September 5, 1969)

The purpose of these amendments to Part 21 is to clarify the requirements governing the certification of import aircraft and approval of imported materials, parts, and appliances, and, to require a certification of conformity for each engine and propeller by the foreign country of manufacture.

These amendments are based on a notice of proposed rule making (Notice No. 68–27) published in the Federal Register on October 31, 1968, (33 F.R. 16005). The comments received in response to this notice indicated concurrence with the proposed rules. Therefore, except as specifically discussed hereinafter, these amendments and the reasons therefor are the same as those contained in Notice 68–27.

In Notice 68–27, it was proposed to amend § 21.130 to require the holder or licensee of a type certificate for foreign aircraft engines and propellers manufactured in a foreign country to furnish with each product imported into the United States, a certification by the country of manufacture similar to the statement of conformity that is required for such products manufactured domestically. This requirement would apply to engines and propellers manufactured in a country with which the United States has an agreement for the acceptance of those products for export and import. Upon further consideration, however, it has been determined by the FAA that while this proposed amendment is appropriate, it should not be included in § 21.130. Section 21.130 comes under Subpart F which governs the production of products under a type certificate only. That subpart contains regulations that are not applicable to aircraft, aircraft engines and propellers manufactured in a foreign country. It is therefore considered appropriate to place the requirement for a certification of conformity for foreign manufactured aircraft engines and propellers in a new Subpart N of the regulations dealing with the approval of import products in general. In this connection, the proposed changed to § 21.307, dealing with approval of import materials, parts, and appliances is also included in this new subpart.

In addition, it is also considered appropriate to make it clear that the certification by the foreign country which is required to be furnished with each import aircraft engine, propeller, material, part, and appliance is the certificate of airworthiness for export referred to in the bilateral agreements with the various countries. This regulation merely reflects the past practice with respect to products, materials, parts, and appliances imported from the bilateral countries.

Editorial changes have been made to the proposed amendment of § 21.130 to accommodate the fact that proposed paragraph (b) is now included in a new section of Part 21. In addition, § 21.130 now reflects the proper approval tag form number.

Interested persons have been afforded an opportunity to participate in the making of this amendment, and due consideration has been given to all matter presented.

In consideration of the foregoing, Part 21 of the Federal Aviation Regulations is amended, effective October 5, 1969.

These amendments are issued under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423) and section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-26

Deletion of Reference to FAA Form Numbers

Adopted: September 22, 1969 Effective: September 30, 1969

(Published in 34 F.R. 15243, September 30, 1969)

The purpose of this amendment to Part 21 of the Federal Aviation Regulations is to clarify § 21.173 and to delete from that section references to obsolete FAA Forms.

Amendment 21-21 (33 F.R. 6856) published in the Federal Register on May 7, 1968, amended Part 21 of the FARs to establish the new classification of special airworthiness certificates. As a result of this change, FAA Forms 305 and 1779, presently referred to in § 21.173, are now obsolete. In view of the fact that the FAA form numbers are constantly subject to change, it is not considered appropriate to refer to such numbers in the regulations. Instead, this amendment merely requires that an application be made in a form and manner prescribed by the Administrator. This is consistent with various other application requirements in the FARs.

In addition to the foregoing, § 21.173 has been amended to make it clear that airworthiness certificates are issued only for U.S.-registered aircraft. Since the registered owner of a U.S.-registered aircraft must be a citizen of the United States, the additional requirement that he must be a United States citizen is unnecessary and the regulation has been amended accordingly.

Since this is a minor, clarifying amendment that imposes no additional burden on any person, I find that notice and public procedure hereon are unnecessary and that it may be made effective in less than 30 days.

In consideration of the foregoing, § 21.173 of Part 21 of the Federal Aviation Regulations is amended, effective September 30, 1969.

This amendment is issued under the authority of Sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421, and 1423) and of Section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-27

Miscellaneous Amendments

Adopted: November 3, 1969 Effective: December 1, 1969

(Published in 34 F.R. 18355, November 18, 1969)

This amendment was made in conjunction with the issuance of Part 36. A complete explanation of this amendment is contained in the preamble to that Part.

(Amended §§ 21.17(a), 21.21(b) and (b)(1), 21.29, 21.31(c), 21.33(b)(1), 21.93, 21.101(a).)

Amendment 21-28

Special Flight Authorizations for Foreign Civil Aircraft, Conditions and Limitations

Adopted: February 5, 1970 **Effective: March 13, 1970**

(Published in 35 F.R. 2818, February 11, 1970)

The purpose of theese amendments is to establish conditions and limitations under which special authorizations may be issued for foreign civil aircraft operated in the United States for market sales or surveys, and to delete the requirement that U.S. aircraft engine manufacturers use only type certificated engines in type certificated aircraft when operated solely for market surveys, sales demonstrations, or customer crew training.

These amendments are based on a notice of proposed rule making (Notice 69-35) which was published in the Federal Register on August 16, 1969 (34 F.R. 13329).

All of the comments received in response to Notice 69-35, with the exception of one, concurred without reservation in the adoption of these amendments. It should be pointed out that under these amendments, § 91.28(b)(5)(i) does not prevent U.S. manufacturers from marketing foreign civil aircraft. These amendments allow foreign civil aircraft to be flown for market sales or surveys without regard to whether or not the operator is the same person as the applicant. Therefore, a U.S. manufacturer may operate the aircraft under the authorization without being the applicant.

As amended, § 21.195(b) permits U.S. aircraft engine manufacturers to conduct market surveys and the other operations specified in the regulation with a type certificated aircraft, whether or not the engines are type certificated. In addition, minor editorial word changes have been made in paragraph (b) for purposes of clarification.

Interested persons have been afforded an opportunity to participate in the making of these amendments, and due consideration has been given all relevant matter presented.

In consideration of the foregoing, Parts 21 and 91 of the Federal Aviation Regulations are amended, effective March 13, 1970.

These amendments are issued under the authority of sections 313(a), 601, 603, and 610(b) of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, and 1430(b)) and section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-29

Reporting Requirements for Manufacturers; Failures, Malfunctions, and Defects

Adopted: February 11, 1970 **Effective: April 2, 1970**

(Published in 35 F.R. 3154, February 19, 1970)

The purpose of these amendments to the Federal Aviation Regulations is to require manufacturers to report certain failures, malfunctions, or defects in the products or articles which they manufacture.

This action is based on the notice of proposed rule making set forth in Notice 69-12 and published in the Federal Register (34 F.R. 5441) on March 20, 1969.

Numerous comments have been received in response to Notice 69-12. While the majority of the comments were generally in favor of the proposed regulations, a number of comments recommended changes in specific provisions of the proposal. These comments are discussed in more detail hereinafter. There were also a few comments requesting that the proposal be withdrawn. While these comments are very general in nature, they appear to be primarily concerned with the belief that the proposed regulations are unnecessary and that the proposed system would not accomplish the stated objectives. The FAA, however, does not agree. Contrary to the opinion expressed in these comments, there are no current regulations that provide all the information covered under the proposal. While there may be other systems for obtaining the necessary failure, malfunction, or defect data that would be as effective as the system proposed, they are not apparent to the FAA at this time.

There were many comments objecting to the reporting time limit proposed in §§ 21.3 and 37.17. These comments were in general agreement that a 4-hour notification limit is unreasonably short since it would not permit the manufacturer time in which to investigate and adequately evaluate a failure, malfunction, or defect which has been "reported" to him. After further consideration, the FAA agrees. A manufacturer, prior to reporting to the FAA a failure, malfunction, or defect, should first confirm its occurrence and determine its effects through a preliminary investigation and analysis. Therefore, the final rule reflects the concern of these commentators and the notification period prescribed in §§ 21.3 and 37.17 is extended to twenty-four (24) hours.

Several comments were received which questioned the meaning of the words "imminent hazard to flight." It appears that these commentators are primarily concerned with the word "imminent" and with the difficulty in administering such a requirement. The FAA appreciates the concern expressed in these comments. As one commentator correctly indicated, the Notice related the information concerning failures, malfunctions, and defects which the FAA proposed to require the manufacturers to furnish, to the same such information the air carriers are currently required to report. Thus, the manufacturers should report any failure, malfunction, or defect that could result in a hazard to flight, without the necessity of deciding whether the hazard is an "imminent" one. The final rule has been revised accordingly.

In the light of the various comments and after further consideration, the FAA has decided that it would not be appropriate to prescribe a form on which manufacturers would be required to report under §§ 21.3 and 37.17. The FAA now considers that the manufacturers should report in the most expeditious manner using any method of communication available to them.

Comments were also received suggesting that the FAA should not be notified of a failure, malfunction, or defect until after the problem is solved, or until after the customer has been notified by the manufacturer. Another commentator recommended that the proposal be withdrawn and that there be closer liaison between the FAA and the manufacturers rather than regulations. The purpose of the proposal as expressed in Notice 69-12, is to provide the FAA with the earliest possible notification of failures, malfunctions, or defects in order that the FAA may take appropriate mandatory action, such as the issuance of an Airworthiness Directive. The FAA has no desire to alter existing manufacture-customer relationships and closer liaison with manufacturers has always been sought by the FAA. However, neither of these recommendations provide a substitute for the proposed regulation.

Several commentators pointed out that many persons holding operating certificates under Parts 121 and 127 also hold STC's and TSO authorizations. They point out that these persons would be required to report the same failure, malfunction, or defect under both the operating rules and the proposed regulation and that this dual reporting requirement is unnecessary. The FAA agrees with this comment. Moreover, the same would apply to persons holding operating certificates under Part 135 as a result of Amendment 135-12 (34 F.R. 19130). Therefore, the final rule provides that failures, malfunctions, or defects already reported under §§ 21.3 or 37.17 need not be reported under §§ 121.703, 127.313, or 135.57. A similar provision for manufacturers holding domestic repair station certificates was proposed in Notice 69-12 and the same relief has been provided in the final rule (by amendment to the foreign repair station regulations) to cover U.S. manufacturers holding foreign repair station certificates.

Finally, there was a comment from a foreign type certificate holder stating that the regulation is not clear as to the agency to whom foreign holders must report. The comment indicated that it would be contrary to accepted practice to report to the FAA directly and that reporting is usually accomplished through their national regulatory authorities. The FAA agrees. There are existing means by which the FAA obtains the necessary information regarding failures, malfunctions, or defects for foreign manufactured parts and products from the appropriate authorities in the country of manufacture. The FAA does not consider that it is necessary or appropriate to apply the proposed rule to foreign manufacturers at this time.

In consideration of the foregoing, Parts 21, 37, 121, 127, 135, and 145 of the Federal Aviation Regulations are amended, effective April 2, 1970.

These amendments are made under the authority of sections 313(a), 601, 603, 604, and 607 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1427), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-30

Reporting Requirements for Manufacturers; Failures, Malfunctions, and Defects. Extension of Effective Date

Adopted: March 24, 1970 **Effective: March 24, 1970**

(Published in 35 F.R. 5319, March 31, 1970)

The purpose of this amendment is to extend to July 2, 1970, the effective date of the recently adopted regulation requiring manufacturers to report certain failures, malfunctions, or defects in the products or articles which they manufacture.

On February 11, 1970, the FAA adopted Amendments 21-29; 37-19; 121-58; 127-15; 135-15; and 145-9 and these amendments were published in the Federal Register on February 19, 1970, to become effective April 2, 1970. However, by letter dated March 4, 1970, the General Aviation Manufacturers Association, Inc., (GAMA) has requested a postponement of the effective date for at least 90 days. GAMA states that while the effect of the rule is still being studied and plans to meet the reporting requirements are being processed, such cannot be completed within the 28 working days allotted. The FAA agrees that some manufacturers may not be able to establish the necessary procedures and to assemble the necessary staff by April 2, 1970, and that justification exists for extending the effective date to July 2, 1970.

Since this amendment is an extension of the effective date of a new requirement and imposes no additional burden on any person, I find that notice and public procedure thereon are unnecessary and that good cause exists for making this amendment effective on less than 30 days notice.

In consideration of the foregoing, the effective date of Amendments 21-29; 37-19; 121-58; 127-15; 135-15; and 145-9 published in the Federal Register (35 F.R. 3154) on February 19, 1970, is extended to July 2, 1970.

This amendment is issued under the authority of sections 313(a), 603, 604, and 607 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-31

Delegation Option Authorization: Issuance of Experimental Certificates

Adopted: May 4, 1970 **Effective: June 8, 1970**

(Published in 35 F.R. 7292, May 9, 1970)

The purpose of this amendment to Part 21 of the Federal Aviation Regulations is to expand the purposes for which experimental certificates may be issued by the holder of a Delegation Option Authorization.

This amendment was proposed in Notice No. 69-49 issued on November 8, 1969 (34 F.R. 18094). All the comments received in response to the notice favored the adoption of the amendment. However, upon further review the FAA considers it appropriate to make it clear that the purposes stated in the proposal for which a Delegation Option Authorization manufacturer may issue experimental certificates apply only to the aircraft for which the manufacturer has applied for a type certificate or an amended type certificate. The proposal has been changed accordingly.

In consideration of the foregoing, paragraph (b)(4)(i) of § 21.251 of Part 21 of the Federal Aviation Regulations is amended to read as follows, effective June 8, 1970.

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(c), 1421, and 1423) and section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-32

Issue of U.S. Airworthiness Certificates for Restricted Category Import Aircraft

Adopted: June 15, 1970 **Effective: June 23, 1970**

(Published in 35 F.R. 10201, June 23, 1970)

The purpose of this amendment to § 21.185 of Part 21 of the Federal Aviation Regulations (FAR's) is to provide for the issuance of airworthiness certificates for foreign manufactured aircraft that are type certificated in the restricted category under § 21.29 of the FAR's and imported into the United States.

Section 21.29 provides for the issuance of a U.S. type certificate for an aircraft that is manufactured in a foreign country with which the United States has an agreement for the acceptance of these products for export and import and that is to be imported into the United States. In general, these agreements with the various foreign countries extend to civil aircraft of all categories, and the FAA has recently issued a restricted category type certificate under § 21.29 for an airplane manufactured in a foreign country. However, § 21.185 of the FAR's, which governs the issue of airworthiness certificates for restricted category aircraft, clearly does not take into consideration aircraft type certificated under § 21.29 in the restricted category only. This has created no problem in the past, since the FAA has not previously been requested to type certificate on import aircraft in the restricted category only. However, in view of the recent type certification action under § 21.29 for an airplane that has never been type certificated by the United States in any other category, a clarifying amendment to § 21.185 is necessary to further implement the existing agreements with the various foreign countries by providing for the issuance of airworthiness certificates for import aircraft type certificated in the restricted category only.

For the foregoing reasons, and since the amendment imposes no additional burden on any person, I find that notice and public procedures thereon are unnecessary and that good cause exists for making this amendment effective in less than 30 days.

In consideration of the foregoing, § 21.185 of Part 21 of the Federal Aviation Regulations is amended, effective June 23, 1970, by adding a new paragraph (c).

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421, and 1423) and section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-33

Reporting Requirements for Manufacturers; Failures, Malfunctions, and Defects. Extension of Effective Date

Adopted: June 26, 1970 **Effective: June 26, 1970**

(Published in 35 F.R. 10653, July 1, 1970)

The purpose of this amendment is to extend to October 2, 1970, the effective date of the recently adopted regulation requiring manufacturers to report certain failures, malfunctions, or defects in the products or articles which they manufacture.

On February 11, 1970, the FAA adopted Amendments 21-29; 37-19; 121-58; 127-15; 135-15; and 145-9 and these amendments were published in the Federal Register on February 19, 1970, to become effective April 2, 1970. The effective date was subsequently extended to July 2, 1970, at the request of the General Aviation Manufacturer's Association, Incorporated, to enable manufacturers to establish procedures and to assemble the staff needed to comply with the new regulations (Amendments 21-30; 37-20; 121-59; 127-16; 135-16; and 145-10, 35 F.R. 5319, March 31, 1970). I have determined that there is a need for a further extension of the effective date of the new regulations for an additional 90 days.

Since this amendment is an extension of the effective date of a new requirement and imposes no additional burden on any person, I find that notice and public procedure thereon are unnecessary and that good cause exists for making this amendment effective on less than 30 days' notice.

In consideration of the foregoing, the effective date of Amendments 21-29; 37-19; 121-58; 127-15; 135-15; and 145-9 published in the Federal Register (35 F.R. 3154) on February 19, 1970, is extended to October 2, 1970.

This amendment is issued under the authority of sections 313(a), 603, 604, and 607 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-34

Production Under Type Certificate

Adopted: August 11, 1970 **Effective: August 15, 1970**

(Published in 35 F.R. 13008, August 15, 1970)

The purpose of this amendment to Part 21 is to authorize an extension of the period within which products may be manufactured under a type certificate only without establishing an approved production inspection system.

Present § 21.123(c) requires a manufacturer to establish an approved production inspection system for products manufactured more than 6 months after the date of issue of the type certificate for that product. This 6-month limitation has proven to be impracticable for products which are in limited or infrequent production and for licensees and transferees of type certificates that were issued more than 6 months prior to the licensing agreement or transfer.

Since this amendment removes an unnecessary restriction and imposes no additional burden on any person, the FAA finds that notice and public procedures on this amendment are unnecessary and that good cause exists for making it effective on less than 30 days' notice.

In consideration of the foregoing, § 21.123(c), Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended, effective on publication in the Federal Register.

This amendment is made under the authority of Sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and Section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-35

Reporting Requirements for Manufacturers; Failures, Malfunctions, and Defects Extension of Effective Date

Adopted: September 28, 1970 **Effective: September 28, 1970**

(Published in 35 F.R. 15288, October 1, 1970)

The purpose of these amendments is to further extend the effective date of Amendments 21-29, 37-19, 121-58, 127-15, 135-15, and 145-9 to the Federal Aviation Regulations which require manufacturers to notify the FAA of any failure, malfunction, or defect in any product, part, or article manufactured by them that could result in a hazard to flight.

Amendments 21-29, 37-19, 121-58, 127-15, 135-15 and 145-9 were published in the Federal Register on February 19, 1970 (35 F.R. 3154) to become effective April 2, 1970. The effective date was first extended to July 2, 1970, by Amendments 21-30, 37-20, 121-59, 127-16, 135-16, and 145-10 (35 F.R. 5319, March 31, 1970) and later extended to October 2, 1970 by Amendments 21-33, 37-22, 121-63, 127-18, 135-19, 145-11 (35 F.R. 10653, July 1, 1970).

Subsequently, however, it has come to the attention of the FAA that some of the reporting requirements set forth in Amendments 21-29, 37-19, 121-58, 127-15, 135-15 and 145-9, are ambiguous and may also require duplciate reporting of certain failures, malfunctions and defects. For these reasons, the FAA considers it necessary to clarify the reporting requirements and to remove any requirement that could result in duplicate reporting. It is contemplated that the amendments necessary to accomplish the foregoing will be issued in the very future.

In view of the foregoing and the imminence of the October 2, 1970, effective date, the FAA has determined that there is a need for a further extension of the effective date of the new regulations.

Since this amendment is an extension of the effective date of a new requirement and imposes no additional burden of any person, I find that notice and public procedure thereon are unnecessary and that good cause exists for making this amendment effective on less than 30 days' notice.

In consideration of the foregoing, the effective date of Amendments 21-29, 37-19, 121-58, 127-15, 135-15, and 145-9 published in the Federal Register (35 F.R. 3154) on February 19, 1970, is extended to November 30, 1970.

These amendments are issued under the authority of sections 313(a), 603, 604, and 607 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-36

Reporting Requirements for Manufacturers; Failures, Malfunctions, and Defects

Adopted: November 24, 1970 **Effective: November 30, 1970**

(Published in 35 F.R. 18187, November 28, 1970)

The purpose of these amendments to the Federal Aviation Regulations is to clarify and relax the reporting requirements for manufacturers and to revoke the amendments to Parts 21, 37, 121, 127, 135, and 145 of the Federal Aviation Regulations contained in Amendments 21-29, 37-19, 121-58, 127-15, 135-15, and 145-9, published in the Federal Register on February 19, 1970 (35 F.R. 3154).

Amendments 21-29, 37-19, 121-58, 127-15, 135-15, and 145-9, effective April 2, 1970, require certain manufacturers to notify the FAA of any failure, malfunction, or defect in any product or part manufactured by them that could result in a hazard to flight. The effective date of those amendments was later extended to November 30, 1970, by Amendments 21-35, 37-25, 121-68, 127-20, 135-21, and 145-12, (35 F.R. 15288). Subsequently, however, it has come to the attention of the FAA that the reporting requirements are, in some instances, ambiguous and in certain areas may require duplicate reporting. Since Amendments 21-29, 37-19, 121-58, 127-15, 135-15, and 145-9 do not become effective until November 30, 1970, the FAA considers it appropriate to clarify the regulations containing the reporting requirements for manufacturers and to remove any requirement that could result in duplicate reporting before those regulations become effective. These changes are discussed hereinafter.

The requirements of §§ 21.3 and 37.17 require a holder of a type certificate (including a supplemental type certificate), or a Parts Manufacturer Approval (PMA), or a TSO authorization, or the licensee of a type certificate, to notify the FAA within 24 hours after it discovers or is informed of a failure, malfunction, or defect in any product or part manufactured by it, of any such failure, malfunction, or defect that could result in a hazard to flight. Several interested persons have recently advised the FAA that this requirement is ambiguous, since any failure, malfunction, or defect, including the failure of a single rivet, could result in a hazard to flight. Thus, they contend, the manufacturers would have to report all failures, malfunctions, and defects. The FAA is aware that this would defeat the purpose of the regulation. Therefore, it is considered appropriate to clarify the regulation by listing the particular occurrences which constitute a hazard to flight for the purpose of reporting requirements and by requiring the reporting of a failure, malfunction, or defect only after it has been determined that such failure, malfunction, or defect has resulted in any of the listed hazards to flight. The requirements of §§ 21.3 and 37.17 have also been revised to make it clear that where a manufacturer determines that there is a defect in any product, part or article that it manufacturers that would result in any of the listed hazards to flight, the manufacturer need only report the defect if any of the defective products, parts or articles have left its quality control system.

The FAA is also aware that requiring a manufacturer to report failures, malfunctions and defects which it "discovers or is informed of" could result in the reporting of unconfirmed occurrences. Such reports would be of no value to the FAA. Therefore, the provisions of §§ 21.3 and 37.17 have been revised so that manufacturers need report only failures, malfunctions, and defects which they have determined have resulted or would result in any of the listed hazards.

In addition to the foregoing, the requirements of §§ 21.3 and 37.17 have been relaxed to make them consistent with similar reporting requirements in the operating rules. In this connection, special late reporting provisions have been added covering reports that would be due on Saturday, Sunday, or a holiday.

Finally, the regulation has been revised to eliminate additional areas where duplicate reporting could occur. Thus, reports need not be made of any failure, malfunction, or defect that the manufacturer knows has already been reported by another person under the Federal Aviation Regulations or that the manufacturer has already reported to the National Transportation Safety Board. Moreover, the FAA is not interested in a manufacturer's report on any failure, malfunction, or defect that is caused by improper maintenance or improper usage.

These amendments contain clarifications and relaxations of the rules that were adopted to become effective on November 30, 1970. They have been coordinated with representatives of the industry to the extent possible. However, in view of the imminent effective date of Amendments 21-29, 37-19, 121-58, 127-15, 135-15, and 145-9, further notice and public procedure hereon is impracticable and good cause exists for making them effective on less than 30 days' notice.

In consideration of the foregoing:

1. The amendments to Parts 21, 37, 121, 127, 135, and 145 of the Federal Aviation Regulations contained in Amendments 21-29, 37-19, 121-58, 127-15, 135-15, and 145-9, published in the Federal Register on February 19, 1970 (35 F.R. 3154) and Amendments 21-30, 37-20, 121-59, 127-16, 135-16, and 145-10, published in the Federal Register on

March 31, 1970 (35 F.R. 5319) and Amendments 21-33, 37-22, 121-63, 127-18, 135-19, and 145-11, published in the Federal Register on July 1, 1970 (35 F.R. 10653) and Amendments 21-35, 37-25, 121-68, 127-20, 135-21, and 145-12, published in the Federal Register on October 1, 1970 (35 F.R. 15288) are hereby revoked effective November 30, 1970; and

2. Parts 21, 37, 121, 127, 135, and 145 of the Federal Aviation Regulations are amended, effective November 30, 1970.

These amendments are made under the authority of sections 313(a), 601, 603, 604, and 607 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1427), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

NOTE: The reporting and/or recordkeeping requirements contained herein have been approved by the Bureau of the Budget in accordance with the Federal Reports Act of 1942.

Amendment 21-37

Reporting Requirements for Manufacturers; Failures, Malfunctions, and Defects

Adopted: December 1, 1970 **Effective: December 4, 1970**

(Published in 35 F.R. 18450, December 4, 1970)

The purpose of these amendments to Parts 21 and 37 of the Federal Aviation Regulations is to permit the first report under §§ 21.3 and 37.17 to be made after January 3, 1971.

As issued on November 24, 1970, effective November 30, 1970, (35 F.R. 18187) §§ 21.3 and 37.17 require a holder of a type certificate (including a supplemental type certificate), or a Parts Manufacturer Approval (PMA), or a TSO authorization, or the licensee of a type certificate, to report to the FAA any failure, malfunction, or defect in any product manufactured by it that it determines has resulted in specified occurrences. The General Aviation Manufacturers Association, Inc. (GAMA) has requested that the FAA delay compliance with the reporting requirements for 30 days to permit the manufacturers time in which to establish the necessary procedures for compliance with those requirements. In view of the representations made by GAMA, the FAA agrees that the persons covered by §§ 21.3 and 37.17 should not be required to make the first report until after January 3, 1971.

Since these amendments grant relief by extending the date for compliance with a new requirement and impose no additional burden on any person, I find that notice and public procedures hereon are not necessary, and these amendments may be made effective immediately.

In consideration of the foregoing, Parts 21 and 37 of the Federal Aviation Regulations are amended, effective December 4, 1970.

These amendments are made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21–38

Replacement and Modification Parts

Adopted: May 19, 1972 **Effective: June 26, 1972**

(Published in 37 F.R. 10658, May 26 1972)

The purpose of these amendments to Parts 21 and 45 of the Federal Aviation Regulations is to revise and clarify the requirements for the manufacturer of approved replacement and modification parts for sale for installation on a type certificated product.

These amendments are based on a Notice of Proposed Rule Making (Notice 69–36) issued on August 13, 1969, and published in the Federal Register on August 20, 1969 (34 F.R. 13421). Numerous comments were received in response to Notice 69–36 and the more pertinent of these comments are discussed below. Based upon these comments and upon further consideration by the FAA, a number of substantive and editorial changes have been made to the proposed rule. Interested persons have been afforded an opportunity to participate in the making of these amendments, and due consideration has been given to all relevant matter presented. Except as modified by the following discussion, the reasons for these amendments are those in the Notice.

One comment suggested that a Parts Manufacturer Approval (PMA) should not be required for the production of parts for altering or maintaining an agricultural or other special purpose aircraft where such parts or modification will not affect the flight, structural, or safety characteristics of the aircraft. The FAA does not agree. In order to maintain the airworthiness of any aircraft, including agriculture and other special purpose aircraft, parts used in altering or maintaining that aircraft must meet the airworthiness requirements applicable to that product. Moreover, the FAA is not aware that there are parts used in the altering or maintaining of an aircraft, especially agriculture or other special purpose aircraft, that would not affect the flight, structural or any other safety characteristic of the aircraft and the commentator did not identify the parts he had in mind. Thus, the FAA is not aware of any parts that would be produced for sale for installation on a type certificated product that should not be covered by the requirements of § 21.303. It should be noted, however, that parts produced by an owner or operator for maintaining or altering his own product are excepted from the requirements of § 21.303 and this exception would also apply to owners and operators of agriculture or other special purpose aircraft. In this connection, one commentator objected to excluding from the PMA requirements parts produced by an owner or operator for maintaining or altering his own product. However, such parts are not produced in quantity and the airworthiness of the parts is determined during the process of approving the design change or the maintenance for the aircraft. Such parts have been excepted from the PMA requirements for a number of years without any adverse effect on safety.

Numerous comments were received concerning proposed § 21.303(c) which specifies the data and other information that must be submitted with a request for a PMA. Some of the commentators suggested that the proposal should be strengthened by requiring a PMA applicant to further identify and explain the source of the substantiating technical data submitted with his application. Other commentators felt that such a requirement was unnecessary and that if the drawings, specifications, and other technical data submitted by an applicant established that the design of the part meets the applicable airworthiness requirements no further requirement should be imposed on the applicant. The purpose of § 21.303(c) is to ensure that the design data which a PMA manufacturer uses to produce replacement and modification parts meets the airworthiness requirements applicable to the product on which the part is to be installed and the proposal, as modified herein, would require the applicant to submit the technical data and test reports necessary for the FAA to make that determination. If the design meets the applicable requirements and the parts are manufactured under the required fabrication inspection system, they will be safe for installation on the type certificated product. To require an applicant to present to the FAA data which is not necessary for that determination cannot be justified in the interest of safety. In addition, some confusion concerning the proposed requirements of § 21.303(c) is evident from a reading of the comments. In this connection, the proposal has been revised to make it clear that a part need not be identical to a previously approved part in order to be covered by a PMA. Manufacturers who produce replacement or modification parts based on a new design may obtain PMA approval for such parts if they meet all the applicable requirements. In addition, the regulation has been revised to make it clear that all applicants for a PMA must submit the required design data. However, if an applicant shows that his design is identical to a previously approved design, the regulations make it clear that he need not furnish the test reports and computations that supported the approval of that design. This has long been a practice in complying with § 21.303 and it is set forth in Advisory Circular AC No. 21.303-1 dated March 2, 1966. In this connection, while the proposal required the applicant to furnish the "technical data necessary to substantiate the design", the final rule uses the language of § 21.21(b) referenced in the current regulation and requires that the applicant submit the test reports and computations necessary to show that the part meets the applicable airworthiness requirements. In this instance, the applicable airworthiness requirements are the airworthiness requirements applicable to the product on which the part is to be installed.

In response to numerous comments, the term "reverse engineering" is not used in the final rule. As pointed out by the comments, reverse engineering is but one way that an applicant may obtain the design for his part. Therefore, there is no need to use the term in the regulation. It should be noted that, as indicated in the Notice, the FAA does not expect that designs of parts obtained through reverse engineering would be identical to that of the original. Therefore, it is expected that test reports and computations would be necessary for such parts. Finally, the proposal required that an applicant submit, in addition to the drawings and specifications, "other technical data" necessary to establish the design of the part. In response to comments, the final rule identifies such "other technical data" as information on dimensions, materials, and process necessary to define the structural strength of the part.

Many comments suggested changes to the requirements of proposed § 21.303 which merely sets forth in detail the requirements of Part 21 which are incorporated by reference in present § 21.303(a). Most of these suggestions would require substantive changes in the current requirements and are outside the scope of the Notice. Although many of the suggested changes cannot be adopted on the basis of Notice 69-36, they will be given further consideration and those having merit will be included in future rulemaking concerning this matter.

The requirement in proposed paragraph (i) of § 21.303 has been deleted because it would be an unnecessary duplication of the requirement for identification of replacement and modification parts in § 45.15 of Part 45. Proposed paragraph (j) is adopted as paragraph (i), without change.

One comment objected to the requirement in proposed paragraph (k) that the holder of a PMA must notify the FAA within 10 days after relocation or expansion of his manufacturing facilities at other locations. The commentator stated that 10 days was unduly restrictive and recommended it be changed to 30 days. The FAA does not agree. The requirement is merely one of notification and to delay notification for 30 days, particularly when critical parts are involved, would hinder the FAA's surveillance of PMA manufacturers. The amendment is adopted as proposed and designated as paragraph (j).

Proposed paragraph (l)(1) of § 21.303 has been deleted because it duplicates the requirement of paragraph (h) and the amendment to proposed paragraph (l)(2) is adopted without change and designated as paragraph (k).

Proposed § 45.15 did not expressly except small parts or parts on which marking is impractical from the requirement that parts must be marked with manufacturer's identification and the part number. However, in response to comments, it has been determined that the regulation should permit any or all of the information specified in § 45.15 to be set forth on a tag attached to the part when the part is too small or the required marking is otherwise impractical. The proposal has been revised accordingly.

Two comments recommended that proposed § 45.15 be changed to require that all the parts be marked with the manufacturer's identification to permit identification of each part that fails. The FAA does not agree. Such a requirement is not appropriate for the parts that are too small or otherwise impractical to mark. In these instances such information should be marked on a tag attached to the part or its container.

In consideration of the foregoing, Parts 21 and 45 of the Federal Aviation Regulations are amended, effective June 26, 1972.

These amendments are adopted under the authority of sections 313, 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421, and 1423), and section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

> NOTE: The reporting and/or recordkeeping requirements contained herein have been approved by the Bureau of the Budget in accordance with the Federal Reports Act of 1942.

Amendment 21–39

Noise Standards for Newly Produced Airplanes of Older Type Designs

Adopted: October 19, 1973 **Effective: December 1, 1973**

(Published in 38 F.R. 29596, October 26, 1973)

The purpose of these amendments is to require certain new production turbojet and transport category airplanes to comply with the noise standards of Part 36 of the Federal Aviation Regulations, irrespective of type certification date, as a condition for the issuance of certain standard airworthiness certificates. The primary basis for these amendments is § 611 of the Federal Aviation Act of 1958 (49 U.S.C. 1431) as amended by the Noise Control Act of 1972 (P.L. 92–574).

These amendments are based on Notice 72–19, published in the Federal Register on July 25, 1972 (37 FR 14813). Interested persons have been afforded an opportunity to comment on the matters contained herein, and all relevant comments have been considered in the issuance of these amendments.

Pursuant to 49 U.S.C. 1431(b)(1), the Federal Aviation Administration has consulted with the Secretary of Transportation, concerning all matters contained herein, prior to the adoption of this amendment. Pursuant to that paragraph and § 8(b) of the guidelines of the Council on Environmental Quality concerning statements on proposed Federal actions affecting the environment, published in the Federal Register on April 23, 1971 (36 F.R. 7724), the Federal Aviation Administration has consulted with the Environmental Protection Agency and has submitted this amendment to that agency for review and comment.

Public comments received in response to Notice 72–19 concerned the following issues: The economic reasonableness, basic fairness, and cost effectiveness of the noise limits to be applied; the timing of the proposed amendments; the scope of the proposed regulation, relation to international certification concepts; use of the airworthiness certificate as the instrument of compliance; the details of noise measurement in Part 36; and compliance with § 102(2)(C) of the National Environmental Policy Act of 1969.

I. *Comments concerning the economic reasonableness, basic fairness, and cost effectiveness of the proposals.* Numerous public comments were received concerning the economic reasonableness, basic fairness, and cost effectiveness of the proposed regulations. These comments, and the FAA's response thereto, are as follows:

1. The notice justified applying Part 36 noise limits to the production of new aircraft now, and deferring for further analysis the question of retrofit of operating aircraft. One reason stated for this approach was that the economic impacts of production line changes are less severe than the economic impacts of changes to operating aircraft. It was argued, in one comment, that the distinction between the economic aspects of production line aircraft modification and the economics of retrofit of operating aircraft is an invalid distinction, and that retrofit and production modification should not be separately accomplished but should both be done together, immediately. The FAA agrees that the total solution to the noise problem involves reduction of the noise of the fleet of operating aircraft (as well as noise restraints imposed during production.) However, the FAA also believes that the economic implications of retrofitting fleet operating aircraft are sufficiently different from those of production line modification of currently produced aircraft to justify taking this incremental step now without waiting for fleetwide retrofit or replacement of older operating aircraft with newer types.

2. It was stated that the only benefit from the proposed regulation is halting of the rise in nuisance, that this rise is only slight, and that the public benefit therefore does not justify the cost. This comment neglects the critical complementary relationship between source noise reduction and land use management. The FAA believes that a major precondition of responsive local land use decisions around airports is Federal action to firmly contain, at predictable and defineable levels, the source noise of air-

craft. This amendment takes a definite step in that direction by ensuring that all new production subsonic transport category and turbojet engine powered aircraft, like new aircraft types within those classes, come within the noise limits of Part 36. Whether or not this amendment, like Part 36 itself, will halt or reduce annoyance (in terms of how many people are how badly affected) will necessarily be closely related to the effectiveness of State and local initiatives in moving toward land use compatibility around airports based on the clear and definite source noise limitations of Part 36. The true public benefit of this amendment and of following efforts to reduce fleet noise levels thus depends, to an important extent, on the success or failure of the land use aspect of the airport noise problem. Considering the extreme importance of a firm source noise limit to local land use initiatives, the FAA believes that the costs to be borne by the aircraft industry to meet this amendment are reasonable and necessary even if the specific degree of public benefit to be actually derived from the needed corresponding land use controls cannot be guaranteed by this amendment until such land use controls are exercised.

3. It was stated that the regulation would create an inequity since operations of complying aircraft would be penalized with respect to both initial cost and increased operating cost, when compared with operators of noncomplying aircraft already in the fleet. The FAA believes that the cost differences between these two classes of operators are acceptable and are justified by the need to begin the process of controlling the noise of older type designs at the production phase. It is further believed that, contrary to this comment, the economic and other noise related pressures on operators of noncomplying aircraft will in fact make that class of aircraft the less desirable one for operators concerned with the long term impact of airport community relations and for operators concerned with the fact that future rule making will ultimately eliminate the class of aircraft that do not comply with Part 36 noise limits.

4. It was argued that FAA should wait for the normal attrition of older aircraft and should encourage the evolution of truly beneficial new type designs, but should avoid the great cost and small benefit of modifying older type designs. It was also argued that the Notice of Proposed Rule Making was in error in stating that continued production of older aircraft without noise treatment delays the introduction of newer, quieter aircraft into the fleet. It was finally stated that most older aircraft types will be retired, regardless of rule making, by the end of the decade. In contrast to this, another comment stated that "the continued production of noisy, old-technology aircraft is an economic disincentive to investment in the newer, more environmentally compatible designs and, as such, should be discouraged." The FAA does not believe that waiting for the normal retirement of older aircraft is a viable or effective approach to controlling the noise generated by the current fleet of aircraft. Practicable means exist for taking incremental actions, such as this amendment, to contain the impact of new noise sources within the established limits of Part 36. As the notice stated, continued production of new aircraft without noise treatment counteracts the acoustic benefit available from the introduction of new technology aircraft. This is true regardless of the policies to be applied to older aircraft now in the fleet and is particularly relevant since the purchase of these new aircraft may represent decisions not to purchase a competive new technology aircraft. To this extent, the FAA agrees that continued production of older aircraft is in fact an economic disincentive to investment in the newer types of aircraft.

5. It was argued that it is unfair to require aircraft at the low end of the weight scale to come down in noise to levels that are lower than are acceptable under Part 36 at the higher weights, since community annoyance is not related to weight. This argument ultimately leads to the conclusion that all aircraft noise levels should be permitted to be as high as those of the heaviest aircraft. Since weight is directly related to the propulsion requirements of an aircraft, and those requirements significantly affect the amount of quieting that can be accomplished, the purpose of the weight parameter in Part 36 is to ensure that all reasonable noise abatement technology is applied for each weight. It should also be pointed out that lighter aircraft may be operating in and out of close-in community noise environments associated with smaller airports and should accordingly receive all the noise abatement technology that can reasonably be applied to aircraft of their lesser weights regardless of whether that same degree of quieting is possible for heavier aircraft.

6. It was stated that it is unfair to require design changes in the latest production aircraft without requiring changes in operating procedures. The question of operational procedures is being studied by the FAA to determine which procedures would be most responsive to the particular needs of particular airport/community situations. Air traffic control procedures already employed include provisions for keeping traffic at higher altitudes where possible near noise sensitive areas, and for the use of preferential runways and traffic flow patterns that minimize noise impact to the extent possible. When further procedures are developed that are shown to bring significant benefits to the communities around airports, they will be employed. However, the FAA does not believe that it is inequitable to require source noise reductions during the period that operating procedures are being developed or modified as experience is gained in that regulatory area, particularly since the resulting aircraft modifications will increase the effectiveness of virtually any procedures selected later.

7. It was stated that the rule is not economically reasonable for business jets, and that, because of the relatively small number of new general aviation jet aircraft that are expected, the cost of the necessary development programs "would be substantial, and for all practical purposes uneconomic—" it was emphasized that the real economic impact of the regulation is in the engine and airplane research and development programs required to develop complying hardware. Another comment stated that effective research and development programs for small jets, such as the extensive programs for heavy aircraft that were federally funded, should also be federally funded, and that, without such Federal funding, the developmental costs of complying with the regulation would be impossible to absorb. The FAA recognizes that there has not been Federal funding of noise research, for smaller jet aircraft, to the extent that such funding has been provided for the larger aircraft. However, the present rulemaking has been determined to be reasonable and appropriate at this time, without Federal funding, because of the success of private industry initiatives. The manufacturers of business and corporate jet airplanes and jet engines have, without Federal funding, instituted developmental programs that have successfully resulted in the technological capability to produce airplanes that can be shown to comply with Part 36 within the compliance periods specified in this amendment. Thus the costs of compliance with this amendment, with respect to the development of the requisite technological capability, have to a large extent already been incurred. These costs were incurred, wholly apart from regulatory pressures, to ensure the continued viability of business jet capital investments under increasingly severe environmental pressure affecting aircraft marketing. In summary, the FAA does not believe that issuance of this amendment creates research and development costs that require Federal financial support. Howver, it is recognized that future regulatory action may result in technological developments requiring a reassessment of the need for Federal research and development funding.

8. It was stated that the regulation should specifically exclude aircraft that are already sold or offered with a firm price option as of the rule adoption date because such aircraft represent commitments for which the manufacturer cannot recover additional new hardware costs. The FAA recognizes that any change in regulatory law that affects aircraft design and that is made effective anytime before the distant future may affect the relations between manufacturer and purchaser. Safety-related technical modifications and product replacement modifications are often accomplished on aircraft during production. The precise apportionment, between manufacturer and purchaser, of cost increases during production is properly arrived at as a matter for contract between buyer and seller. As a practical matter, some aircraft are sold years before delivery. Acceptance of this comment (e.g. by excluding aircraft that were "sold" or "offered with a firm price option" on the rule adoption date) could result in continued production of noncomplying aircraft for many years. Finally, a regulation whose effectivity was dependent upon proof of the status at law of a contract price would be virtually impossible to administer fairly and impartially. For these reasons, this comment cannot be accepted. For these reasons also, the FAA disagrees with another comment requesting exclusion of "all aircraft under contract or firm option as of October 1972."

9. It was urged that the FAA consider the probability of lost or canceled aircraft sales in its determination of the economic reasonablenes of the costs of complying with

the regulation. While this probability is difficult to assess, the FAA is encouraged to note that a growing number of aircraft manufacturers and operators, reacting to the increasing importance of aircraft noise as a detriment to industry growth, have chosen to stress compliance with Part 36 as a significant competive factor. The FAA believes that this reflects the development of long range changes in the response of aircraft marketing factors to the problems of community acceptance and airport noise, and that lack of compliance with Par. 36 will eventually be more closely related to lost or cancelled aircraft sales than will the economic costs of complying with the regulation.

10. It was stated that it would be economically unreasonable to require that aircraft, that are modified during production to meet Part 36, also be modified again under a later retrofit requirement. This comment stated that issuance of this amendment should be accompanied by a guarantee against such "recurrent retrofit." The FAA agrees that, on any subsequent noise retrofit program, the combined economic impacts of that program and of other environmental regulations (such as aircraft emission requirements or previously issued noise requirements) may be considered in an overall determination of economic reasonableness. However, the FAA does not believe that it would be consistent with its overall environmental responsibilities to exclude aircraft from later reasonable environmental control regulations merely because earlier regulations have been complied with.

11. It was stated that the regulation should permit exceedances over the Part 36 noise limits in order to accommodate the necessary practice of intermixing engines or nacelles. Such intermixing occurs when engines or nacelles (which may have been produced earlier or produced as replacement components and might not incorporate the required acoustical design provisions) are installed as quick change units, to minimize aircraft down-time. The result may thus be the replacement of one or more acoustically treated engines or nacelles with untreated components. The FAA understands the great importance of intermix to efficient fleet management. However, it is believed that any noise deterioration resulting from these normal intermix practices should occur within the Part 36 noise limits. This is essential to public confidence in the accuracy and meaning of the noise limits, set in Part 36, as descriptors of the actual noise reductions achievable by the airplane. The FAA believes that the manufacturers should reasonably be expected to ensure that their products have sufficient compliance margin under the Part 36 noise levels to permit their customers to engage in such a wide spread and common practice as engine nacelle intermix without exceeding the maximum noise limits prescribed for the airplane.

II. *Comments concerning the timing of the proposed regulations.* Comments were received stating that the proposed regulation, while not reasonable as proposed, could be made reasonable by delaying the compliance dates. These specific comments, and the FAA responses thereto, are as follows:

1. It was stated that, in order for the requisite noise research and development to be accomplished for smaller jet aircraft, compliance with Part 36 should not be required for business jets before the "end of this decade." It was argued that this time lag would be needed if the history of acoustical research for large jets is any guide to the amount of research that would be needed for the smaller jet aircraft. The FAA disagrees with this comment. Extensive review of all material submitted with respect to the smaller jet aircraft (e.g. airplanes with maximum weights of 75,000 lbs. and less) indicates clearly that, with one possible exception, production quality hardware adequate to permit Part 36 to be achieved is either now available, or will be available for installation on production aircraft, before the date specified in this amendment (December 31, 1974). The one aircraft for which this evaluation is less clear is a business jet for which the required production quality hardware may not be available to be incorporated on a production basis until early or middle 1975. However, the FAA believes that, even for this aircraft, a maximum effort on the part of the manufacturer has a reasonable chance of meeting the compliance date in this amendment, and that the compliance date for the entire class of business jet aircraft should not be delayed in order to accommodate the potential problems of the one aircraft type. This amendment, therefore, specifies December 31, 1974, as the compliance date for all airplanes with maximum weights of 75,000 lbs. and less. If the manufacturer of the aircraft in question believes that he can demonstrate that this deadline should not, in the public

interest, be applied to his aircraft, he may petition for an exemption that must, under the Noise Control Act of 1972, be reviewed by the FAA in consultation with the U.S. Environmental Protection Agency. No suggestions is made here with respect to the result of such a review.

2. It was argued that a delayed compliance date of mid-1978 should be chosen to permit introduction of the requisite design technology into the "normal cycle for development of new engine airframe combinations." The problems of procurement of long-lead hardware (such as forgings), the time problems involved in providing production engineering drawings, designing and building production tooling, and assembly of the new hardware on the aircraft were stressed as reasons for delaying implementation of the rule. After thorough review of all of these factors, the FAA believes that the compliance dates in this amendment provide adequate time for compliance and that no further extension of time is justified. It should be pointed out that these dates involve a relaxation from those proposed in the Notice, which contemplated compliance by July 1, 1973, or July 1, 1974, depending on aircraft weight.

3. It was argued in docketed comments that the result of the Notice, if issued as a final rule, would be the virtual shutting down of production of one airplane type. However, information obtained since receipt of the docketed comments indicates that this early assessment was overly conservative and that the business jet in question will in fact be able to be produced, in compliance with this amendment, on or before December 31, 1974.

4. It was stated that the regulation should be effective for JT8D powered airplanes first flown on or after January 1, 1974, and for JT3D powered airplanes first flown on or after January 1, 1975. After review of all material submitted with respect to the power plants that are employed in the larger jet aircraft, the FAA believes that December 1, 1973, is a reasonable date for all engines except the JT3D and that December 31, 1974, is a reasonable date for aircraft powered by that engine.

5. It was stated that the regulation should not become effective, for the smaller jet aircraft, less than 30 months after its issuance. It was argued that such a delay is necessary "to accomplish the required design changes and configuration compromises in the vehicle for compliance with both noise and engine emission standards." The FAA agrees that the combined economic effects of noise and emission standards should be carefully watched, and has been working closely with the U.S. Environmental Protection Agency to ensure that there is a coordinated review of the economic impacts of the aircraft noise regulatory program of the FAA and the economic impacts of the aircraft emission control program of EPA (which will be implemented through the issuance of regulations by the FAA). In addition, EPA, in close cooperation with the FAA, is coordinating its own aircraft noise control program (under the Noise Control Act of 1972) with its aircraft emission control program to ensure that noise standards recommended to the FAA by EPA (under the Noise Control Act of 1972) take into account the combined economic impact of noise and emission controls. FAA is confident, in view of this close and continuing coordination, that compliance with this amendment, on or before the dates specified herein, will not be rendered infeasible or unreasonable by mission regulations affecting the same aircraft.

6. It was stated that one type of air carrier aircraft for which Part 36 capability has already been achieved should be immediately subject to the regulation. Considering that, under this amendment, the required hardware must be procured to be installed across the board on all production versions of this airplane, the FAA believes that the time between issuance of this amendment and the prescribed compliance date (December 1, 1973) does not represent an unreasonable delay.

7. It was stated that, from a cost effectiveness point of view, for aircraft for which substantial quieting below Part 36 noise levels is possible by reengining, the costs of an interim (but acoustically less effective) noise reduction to Part 36 noise levels should not be imposed now, and an additional grace period of two years, justified by the greater benefits to be obtained from reengining, should be allowed. The argument that a near term, available environmental improvement should not be implemented if a greater benefit is expected at a later time has some merit in cases in which compliance with the earlier requirement would clearly prevent the later benefit from being achieved in a reasonable manner. The FAA does not believe that this is the case in this instance

and that, if more effective noise reductions become possible through the development of new engines, nothing in this amendment prevents those engines from being developed and installed in an economically sound manner. Therefore, the FAA does not believe that, in this case, the benefits to be obtained from this amendment should be deferred until new engines are developed.

8. Comments concerning the international aspects of the compliance dates in this amendment are addressed in section IV below.

III. *Comments concerning the scope of the proposed regulation.* The following comments were received concerning the applicability and scope of the proposed regulation:

1. It was stated that the regulation should not be limited to transport category and turbojet engine powered airplanes, but should also apply to all other aircraft types, including rotorcraft. The FAA intends to address the noise problem of other classes of aircraft and to develop regulations that achieve the maximum reasonable noise reduction for each class. Part 36, as currently effective, has not been determined to accomplish this purpose for classes of aircraft other than transport category and turbojet engine powered airplane. This amendment, therefore, continues the limitation of current Part 36 to those airplanes.

2. It was stated that the regulation shuld be broadened to include military aircraft. This comment cannot be accepted in view of the limitation of Title VI of the Federal Aviation Act of 1958 (including the noise abatement authority in § 611, as amended by the Noise Control Act of 1972) to "civil aircraft," which term excludes "public aircraft." Military aircraft are "public aircraft."

3. It was stated that newly produced aircraft of older type designs should automatically be covered by later changes to Part 36 and that the limitation of the Part 36 reference to Part 36 "as effective on December 1, 1969" shows a "misguided preoccupation with the economics of noise reduction." In view of the clear command in § 611 of the Federal Aviation Act to consider economic reasonableness, the effect of this recommendation would be to limit the severity of new Part 36 amendments to levels that are "economically reasonable" (however that term is defined) for older type designs. The FAA prefers to issue, for new type designs, regulations that take advantage of all acoustical design potentialities that are available at the early design stage without its environmental objectives being unnecessarily handicapped by the need to consider the impact of such aggressive rule making on older type designs. When it is determined that the technology is available to bring new production versions of older type designs into conformity with later amendments of Part 36, such action is not precluded by this amendment, and can be accomplished by later rule making.

4. It was stated that the regulation should stop all growth in air traffic. In support of this comment it was argued that it makes little sense to decrease the operational noise of individual aircraft and then allow more such aircraft to operate. The FAA believes that the major problems of aircraft noise can be resolved, consistent with the increasing public need for air transportation, by an aggressive combination of source noise reduction and airport land use compatibility planning and land use plan execution. In view of the clear public need for use of the navigable airspace to move persons and property in increasing quantities, the FAA believes that environmentally responsive growth, not termination of growth, is the necessary and appropriate objective.

5. It was stated that the basic standards in Part 36 should be lowered for all aircraft type certificated after January 1, 1980. The question of reduction of Part 36 noise levels for new type certificates is now being considered and will be the subject of a separate regulatory proposal.

6. It was stated that July 1, 1974, should be designated "total retrofit compliance day" for all operational aircraft not already covered by the regulations. The FAA agrees that retrofit of currently operating aircraft (as opposed to assembly of newly produced aircraft in compliance with Part 36) is an important aspect of reduction of total fleet noise levels. This problem is being addressed as a separate regulatory issue. With respect to the specific date mentioned in the comment, however, the FAA has not yet determined that the required technology and hardware will be available to reasonably support a total retrofit program effective on July 1, 1974.

IV. *Comments concerning the international aspect of the proposed regulation.* The international aspects of the proposed regulation were raised in the following comments:

1. It was stated that the Notice unnecessarily departed from traditional policy and practice by providing, for import aircraft, that compliance would be shown if the country in which the aircraft was manufactured certifies (and the Administrator finds) that Part 36 is complied with. It was argued that, for noise type certification, the FAA, in § 21.29, permits the country of manufacture to certify that the aircraft meets either the U.S. regulation or else meets the requirements of the manufacturing country plus any other requirements prescribed by the Administrator to provide noise levels no greater than those prescribed in the U.S. regulation. The FAA agrees that there is no valid reason for this not to apply as well to airworthiness certification findings related to Part 36. This change is, therefore, made as requested [see § 21.183(e), last sentence].

2. It was stated that the regulation should not apply to aircraft sold to foreign operators, and should not apply to "the issuance of export certificates of airworthiness by the FAA whether or not the foreign government imposes noise rules of its own." This amendment, like the Notice, is limited to aircraft for which U.S. standard airworthiness certificates are applied for under § 21.183 and thus does not apply unless such application is made under that section.

3. It was stated that the compliance date should be the same as that specified, in ICAO documents, for compliance with the Noise Standards of ICAO Annex 16, by newly produced aircraft not already covered by that Annex. That date is Jauary 1, 1976. In support of this comment, it was stated that the recommended ICAO date was agreed to in the U.S. position paper, and that "the enforcement of noise standards which, by their technical content or methods of application, are at variance with the standards defined and adopted by ICAO constitutes, in short, an impediment to the harmonious development of air transport and to related trade." It was also stated that a uniform international scheme is essential to any concept of economic reasonableness, and that "the presence of different standards for each country would have serious consequences for international aviation as a service to the world community."

With respect to the U.S. position supporting the recommended ICAO date, this support was based on an assessment of the worldwide impact of the proposed extension of Annex 16 to new production aircraft of all nationalities. This required a more conservative timing conclusion than is consistent with the domestic need to achieve the earliest reasonable compliance by aircraft being issued standard U.S. airworthiness certificates. The FAA does not imply by its choice of dates and other requirements specified in this amendment, that these dates and requirements could be considered equally applicable for other countries. With respect to the value of worldwide uniformity in noise regulatory actions, however, it is agreed that such is desirable where it does not conflict with clearly determined domestic environmental imperatives. In the case of this amendment, it is believed that the dates specified herein are essential to respond adequately to the clear intent of the Congress, expressed in the Noise Control Act of 1972 and its legislative history that an aggressive and early attack on the problem of aircraft noise be accomplished as soon as it can be justified in the light of economic and technological considerations.

V. *Comments concerning use of the airworthiness certificate as the instrument of compliance.* Unlike Part 36, which, until this action, regulated type certification only, this amendment prescribes compliance with noise standards as a condition to the issuance of standard airworthiness certificates. The following comments were received on this aspect of the regulation:

1. It was stated that "the status of airworthiness certificates should not be clouded by noise requirements," and that the proper approach is "amendment of the type certificate." In support of this statement, the comment referred to the handling of the Boeing 747 under Part 36, which provided for the placing of a time limit on the original type certificate of that airplane. Since this amendment applies only to aircraft for which a type certificate has been issued in the past, the result of this comment, if accepted, would be action by the FAA, retroactively, to terminate the legal effect of previously issued type certificates. This would be a fundamentally different action from that involved in the case of the Boeing 747, which case involved only the prospective act of issuing a type certificate with a time limitation. The FAA believes that it is far less

damaging to the interests of type certificate holders to attach conditions to the issuance of subsequently issued airworthiness certificates than to retroactively cloud the type certificate itself with a subsequently issued time limitation on that document.

2. It was stated that shifting the noise compliance process to individual airworthiness certificates is a "profound change" and "greatly diminishes the value of the type certificate." For reasons mentioned above, the FAA believes that use of the airworthiness certification process as the compliance device will have much less effect on the value of the type of certificate than would retroactive amendment of that certificate itself. As stated in the Notice, the airworthiness certificate is a particularly appropriate means of ensuring that individual newly produced aircraft of previously type certificated designs incorporate specific acoustical design features prior to operation. The value of that certificate for this purpose lies in the fact that the airworthiness certificate is individually issued to each aircraft after production, and is, therefore, useful as a means of distinguishing (by date of issuance) those individual aircraft within a production run that require noise compliance.

VI. *Comments concerning the details of noise measurement.* The Notice proposed to apply, to new production aircraft, the requirements of current Part 36 without substantive change. The following comments recommended that changes be made in details of Part 36 as applicable to newly produced aircraft:

1. It was stated that the takeoff noise measurement procedure in current Part 36 is unduly restrictive, and that, rather than require an actual takeoff and a specified climb profile, the regulation should permit determination of noise as a function of power setting during a series of level flyovers of partial climbs. It was stated that such a procedure would be superior to Part 36 in that it would eliminate the need for finding an airport for the noise test, while at the same time providing noise data that are as accurate as those derived under the Part 36 procedure. The FAA does not believe that such an amendment of Part 36 is capable to ensuring accurate noise data for all aircraft covered by Part 36. However, if, for a particular aircraft type, it can be determined that a procedure equivalent to any specific takeoff procedure in Appendix A should be approved, that Appendix allows such approval to be made.

2. It was stated that Part 36 should be amended to increase the tradeoff allowance (under which procedure a noise level exceedance at one measurement point can be approved if it is offset or "traded off" by showing noise levels less than the prescribed limit at other measurement points). The FAA does not believe that it is technically or economically unreasonable to apply the current tradeoff provisions to newly produced aircraft or older type designs. This requested relaxation in the rule is, therefore, not believed to be justified.

3. It was stated that the sideline measurement point should be standardized at .35 N.M. rather than preserved as .35 N.M. for 4-engine airplanes and 25 N.M. for airplanes with less than 4 engines. The effect of this request would be to relax the noise limits for the latter class of airplanes. Such a relaxation is not justified by the reason that was submitted in support of this request (namely, that annoyance is not a function of the number of engines), and is not supported by other technical and economic data.

4. It was stated that the minimum reduced power climb gradient specified in Part 36 should be 4% (not the currently prescribed 4% or the gradient resulting from level flight thrust with one engine inoperative, whichever gradient is higher). The reason for this request is that for many aircraft a straight 4% gradient requirement would result in less thrust, which would be quieter. This comment appears to miss one essential purpose of Part 36, which is to not only set noise limits but require that these limits be met with the airplane developing substantial power in order to force the development of real acoustical design improvements rather than permit compliance through quiet piloting techniques. The effect of accepting this comment would be to relax the severity of the acoustical design provisions that must be incorporated in the airplane in order to meet the specified noise limits. This is not viewed as justified.

VII. *Comment concerning compliance with § 102(2)(C) of the National Environmental Policy Act of 1969.* It was stated that issuance of this amendment should be delayed for the preparation and circulation of draft and final environmental impact statements under § 102(2)(C) and related guidelines and orders. Under those guidelines and orders, when a major Federal action "significantly" affects the quality of the human environmental, preparation and circulation of draft and final environmental impact statements are required. This comment takes the position that the impact statement requirements apply in this case. After review of the potential impact of this amendment, the FAA believes that the amount of noise reduction involved and the limited number of affected aircraft require the conclusion that this amendment will not cause a "significant" reduction in the community impact of overall fleet noise. This amendment in no way precludes or limits other environmentally protective regulatory actions that the FAA may take, and does not involve environmental impacts other than the required noise reduction. For all of these reasons, a negative declaration outlining these considerations in detail has been prepared for this action, in accordance with applicable requirements.

Two editorial changes are made to the language proposed in the Notice. The title of Part 36 is revised to refer specifically to type and airworthiness certification rather than refer only to the general term "certification." Also, the language in proposed § 21.183(d) was unduly complex and has been simplified. No substantive change results.

Authority: Sections 313(a), 601, 603, 611, Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1431 (as amended by the Noise Control Act of 1972 (P.L. 92-574)), sections 2(b)(2), 6(c), Department of Transportation Act (49 U.S.C. 1651(b)(2), 1655(c)), Title I of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), Executive Order 11514, Protection and Enhancement of Environmental Quality, March 5, 1970.

In consideration of the foregoing, Parts 21 and 36 of the Federal Aviation Regulations are amended, effective December 1, 1973.

Amendment 21–40

Aircraft and Aircraft Engines—Certification Procedures and Type Certification Standards

Adopted: September 20, 1974 **Effective: October 31, 1974**

(Published in 39 F.R. 35452, October 1, 1974)

The purpose of these amendments is to change the procedural requirements relating to the type certification of aircraft and aircraft engines, to update and improve the airworthiness standards applicable to the type certification of aircraft engines, and to incorporate new standards applicable to engines used on supersonic airplanes. In addition, other new airworthiness standards are made applicable to aircraft on which engines type certificated to previous standards are to be installed.

These amendments are based on the Notice of Proposed Rule Making (Notice No. 71-12) published in the Federal Register on May 5, 1971 (36 F.R. 8383). Except for minor editorial changes, and except as specifically discussed hereinafter, these amendments and the reasons therefor are the same as those proposed in Notice 71-12. Numerous comments relating to these proposals were received in response to the Notice and except for those indicating agreement or merely repeating issues discussed and disposed of in the Notice, the FAA's disposition of the significant comments is discussed below. In general, comments received that were beyond the scope of the Notice are not discussed but will be retained for consideration in connection with other rule-making projects as appropriate. Based on the relevant comments and upon further review within the FAA, a number of changes have been made to the proposed rules. In addition, various non-substantive changes of a clarifying and editorial nature have been made. Since these changes impose no additional burden on any person, they may be adopted without further notice and public procedure.

Interested persons have been afforded an opportunity to participate in the making of these amendments, and due consideration has been given to all matter presented.

Two of the proposals of the original Notice concerning engine rotor system unbalance (§§ 25.1305 and 33.29) have been implemented by a separate rule-making action, Amendments 25–35 and 33–5, effective March 1, 1974, that were published in the Federal Register on January 15, 1974 (39 F.R. 1831).

The following discussion is keyed to the like-numbered proposals contained in Notice No. 71–12:

PART 1—DEFINITIONS AND ABBREVIATIONS

Proposal 1—One commentator objected to the inclusion of a turbo-supercharger as part of the engine in the proposed definition of aircraft engines in § 1.1, asserting that in some instances it should be classified as an accessory. However, the intent of the proposal was that turbo-superchargers be included as part of the engine whether or not they are additionally classified as accessories. The definition as adopted has been revised to clarify that a turbosupercharger is part of an engine whether or not it is also an appurtenance or an accessory.

Proposal 2—Several commentators suggested that the term "stop" be deleted from the definition of "idle thrust" as proposed in § 1.1 since a stop is normally associated with the power control lever or throttle, rather than with the engine fuel control device as suggested in the Notice. The FAA agrees with the comment to the extent that the term "idle thrust" should be related to the power control lever and has changed the definition by replacing the term "fuel control device" with "power control lever." Since the term "stop" is appropriate with this revision, it need not be deleted.

One commentator pointed out that several of the proposed amendments used the term "type" in reference to engines and that the word "type" was defined in relation to aircraft in § 1.1 but not to engines. For internal consistency, the definition of "type" has been amended to include the meaning of the term with respect to the certification of aircraft engines.

PART 21—CERTIFICATION PROCEDURES FOR PRODUCTS AND PARTS

Proposal 1—Several commentators suggested that the stress analysis called for in proposed § 21.15(c) for the engine rotor, spacer, and rotor shaft would not normally be available at the time of application for a type certificate, but would be available before actual certification. The FAA agrees and, upon further consideration, has determined that inclusion of the requirement under the type certification standards will allow an applicant to complete and submit a stress analysis after application for a type certificate and before certification. The requirement for a stress analysis has therefore been removed from § 21.15(c) and relocated in a new § 33.62 under the design and construction requirements for turbine aircraft engines.

Proposal 2—Several commentators recommended deletion of that portion of the proposed § 21.35(f) which requires 300 hours of flight test operations for aircraft incorporating engines of a type not previously used in a type certificated aircraft. They contended that the rule discriminated against new engine types, and that unnecessary economic hardships and delays in the aircraft certification program would be imposed. However, experience with newly certificated engine types has demonstrated to the FAA that there is a need for more thorough flight testing of newly certificated engine types, and the regulation with respect to hours of operation is adopted as proposed. Furthermore, the suggestion of one commentator that allowance be made for the use of experimental engines that differ only in minor ways from the type certificated engine has not been adopted because the FAA believes it could lead to uneven administration of the rule.

One commentator questioned whether the phrase "engines that conform to a type certificate" in subparagraph (f)(1) required just one or a full complement of the newly type certificated engines in a multi-engine aircraft. As indicated in the explanation in the Notice, the intent of the FAA is that "engines" means all the engines in the aircraft. To eliminate any ambiguity, the wording has been changed to specifically call for a full complement of engines.

Proposal 3—No public comment was received on the proposal to amend § 21.97 and the section is adopted as proposed.

PART 23—AIRWORTHINESS STANDARDS: NORMAL, UTILITY, AND ACROBATIC CATEGORY AIRPLANES

Proposal 1—One commentator questioned whether proposed § 23.951(b) would prohibit several fuel tanks from gravity feeding through non-return valves to a single collector box from which the fuel pumps would draw fuel. Such an arrangement is not prohibited and the rule would allow any combination of tanks to be used so long as means are taken to prevent air from being introduced into the system.

In response to the suggestion contained in several comments, the icing requirement of paragraph (c) of proposed § 23.951 has been reworded to clarify that it is applicable solely to turbine engine aircraft, since fuel icing is peculiar to turbine fuels. Additionally, since the requirement is intended to preclude interrupted functioning of the fuel system rather than to require operation for an indefinite time, the rule has been revised to require "sustained" operation rather than "continuous" operation.

Proposal 2—Several commentators questioned whether an applicant would have to comply with amended § 23.997, as proposed, if the similar rule in § 33.67 had already been complied with by the engine manufacturer. The FAA proposed the new requirements to assure that newly certificated aircraft would meet the standards prescribed in § 33.67. Thus, if the aircraft manufacturer incorporated an engine which had been type certificated under new § 33.67 the fuel system would already conform to the rule and nothing further would be required. If, however, the aircraft manufacturer incorporated an engine which had not been certificated under the new § 33.67 he would have to take the necessary action to comply with new § 23.997.

Several commentators questioned whether the proposed rule would require that each and every filter in the fuel system, including small screens and so-called "last chance filters," meet the requirements of paragraph (a) through (d) of proposed § 23.997. The FAA intended that at least one filter upstream of the fuel metering device and the engine driven displacement pump meet these requirements, and the section has been clarified accordingly.

In response to a question raised by one commentator concerned with the availability of heat for the required filter or strainer, the FAA wishes to point out that the requirement for icing protection in turbine engine fuel systems, set forth in § 23.951, applies to the entire fuel system.

As proposed, § 23.997(b) would require a drain. Upon further consideration it has been determined that an equivalent of the drain could be provided by having the strainer or filter easily removable for drain purposes and this alternative has been incorporated into the regulation.

Proposal 3—One commentator questioned whether the oil sump of a dry sump engine would be considered as expansion space under the proposal. If the sump is in fact part of the oil tank, then the sump provides the expansion space specified in § 23.1013(b)(1). Further amendment of the requirement is not considered necessary and § 23.1013(b)(1) is adopted as proposed.

One commentator requested clarification of the phrase "that might reduce the flow of oil," used in proposed § 23.1013(e). Several other commentators suggested that the phrase was inconsistent with, but should be identical to, proposed § 25.1013. The FAA agrees with these comments and has revised the section to make it consistent with § 25.1013 in this respect, by specifying that any oil tank outlet screen or guard may not reduce the flow of oil below a safe value at any operating temperature.

Proposal 4—One commentator suggested that the more technically correct term "differential pressure" be used in place of "pressure," in paragraph (c) of § 23.1015. The FAA believes, however, that the present term is adequately understood in the industry, and has not caused any misunderstanding in the past. The paragraph is therefore adopted as proposed.

Proposal 5—Several commentators expressed the belief that the proposed § 23.1019 might be interpreted to require each and every oil strainer or filter in the system including small so-called "last chance" filters to conform to all the requirements of paragraph (a). The intent of the FAA is to require at least one oil strainer or filter that will filter all the oil that passes through the lubricating system while conforming to the requirements of the section. The rule as adopted has been reworded to make this clear. Another commentator objected to the word "conveys" as inappropriate in the lead-in sentence of paragraph (a). The FAA agrees and has changed the wording to refer to a strainer or filter through which all of the engine oil flows.

Several commentators interpreted the requirement of subparagraph (a)(1) for normal oil flow through the bypass as possibly requiring identical flow and proposed the word "adequate" in place of "normal." The FAA does not agree that the word "normal" means identical and used the word normal to mean normal for the system within its operating range. Therefore, the wording as proposed has been retained.

One commentator stated that filters should be serviced on a routine and normal maintenance basis rather than relying upon an indicator as proposed in subparagraph (a)(3). In this connection it should be noted, however, that the rule does not call for relaxing of any maintenance procedures but adds an additional item which will contribute to safety by providing a quick means of inspecting for possible filter contamination.

It was assumed in one comment that the standard engine oil pressure gauge would qualify as an "indicator" as required in proposed subparagraph (a)(3). While it was considered that a separate indicator would be provided, nevertheless, if the applicant can demonstrate that the oil pressure gauge would adequately perform the function of the indicator, a separate indicator would not be required. Upon further consideration, the function of the indicator in terms of contamination of the screen has been reworded for clarity.

Several commentators questioned whether the wording of subparagraph (a)(4) was realistic in requiring that no contaminants be released through the filter bypass. As proposed, the requirement stated an absolute prohibition against release of contaminants. The FAA agrees that the intended purpose may be met by requiring the bypass to be designed to minimize release of contaminants, and the requirement is reworded accordingly.

Proposal 6—Several commentators objected to the requirement in proposed § 23.1093 for operation in falling and blowing snow on the basis that no standard is specified as to the intensity or the amount of falling snow or the degree of blowing involved. They further point out that no uniform means are provided for demonstrating compliance with the section and that a small or even minute amount of snow might satisfy the letter of the law of this section. One commentator offered detailed standards that could be adopted. However, it was not the intent that specifications for all possible conditions be included in the regulation but, rather, that an applicant select the limitations desired for his airplane and then demonstrate the ability to operate within those limitations.

Several commentators asserted that the specified liquid water content of 2 grams per cubic meter was not representative of actual conditions and would result in more stringent requirements for ground operation than for flight, while another suggested that the requirement for icing protection at idle should be applicable "on the ground" rather than at sea level. Upon further consideration, the FAA agrees that a reduction of 0.6 grams would provide an adequate and safe standard for icing protection at idle conditions on the ground and the requirement has been changed accordingly.

One commentator objected to the requirement for icing protection for 30 minutes at idle, stating that there was insufficient bleed air to adequately meet the requirement for this period of time. However, experience has demonstrated that it is practical and necessary for safety of flight, and that protection for the engine during prolonged idle prior to takeoff is essential to safety of operation. The proposal does not restrict the means for icing protection to engine bleed air, as suggested by the commentator, but allows any means or combination of means which the applicant chooses. With respect to bleed air, the intent of the requirement is that icing protection at idle be provided when the bleed air available for icing protection is at its critical condition. The section has been reworded to make this clear.

Proposal 7—Amendment 23-14, effective December 20, 1973, published in the Federal Register on November 19, 1973 (38 F.R. 31816), amended § 23.1183(a) to require that lines and fittings and components carrying gas, air, or flammable fluids in any area subject to engine fire conditions must be at least fire resistant. That amendment also amended the heading of the section, while retaining the requirement that flexible hose assemblies must be approved. Therefore, the section as amended by this amendment, contains the provisions made effective by Amendment 23-14 in addition to those proposed in Notice 71-12, including the revision of the latter discussed below. Inasmuch as the heading proposed in Notice 71-12 is inappropriate to the section as amended by Amendment 23-14, the heading adopted by the amendment is retained.

Stating that proposed § 23.1183, which concerns engine fire protection, is inappropriately included with aircraft airworthiness standards, one commentator suggested that it more correctly belongs in Part 33 relating to engine airworthiness requirements. However, while this and other sections do relate to engine airworthiness, they are included also in Part 23 and the other aircraft certification parts since it is the intent that aircraft certificated under applications made after the adoption of these amendments conform to the new updated sections of Part 33, whether or not they incorporate engines type certificated under the updated Part 33. Thus, to cover cases where such aircraft incorporate engines certificated under applications made before adoption of these amendments, the new engine standards that are appropriate are made effective as to the aircraft by being incorporated in the aircraft airworthiness sections.

One commentator questioned whether integral oil sumps on smaller reciprocating engines were considered to come within the meaning of flammable fluid tanks as that term was used in proposed § 23.1183. The FAA did not intend that they be included, and the rule as adopted specifically provides that integral oil sumps of less than 20 quart capacity need not be fireproof nor be enclosed by a fireproof shield.

Proposal 8—As a result of the issuance of Amendment 23-14 (38 F.R. 31816), which contains new paragraphs, § 23.1305(q) and (r), the proposed paragraphs (q), (r), (s), and (t) are redesignated (s), (t), (u), and (v), respectively. The following discussion is keyed to the new designations.

One commentator questioned whether the fuel strainer or filter indicator referred to in § 23.1305(t) were required on all filters, even "last chance" filters. Consistent with the requirements applicable to the strainers or filters themselves, § 23.1305(t) has been revised to make clear that the indicator required is for a fuel strainer or filter required under § 23.997. Similarly, § 23.1305(t) and (u) have been reworded in order to be consistent with §§ 23.997 and 23.1019, respectively, in regard to the degree of contamination that must be indicated. In response to a further comment, § 23.1305(t) has been reworded to clarify that the desired indication is of the occurrence of contamination rather than the more stringent requirements of the degree of contamination as suggested in the Notice. This change achieves consistency between paragraphs (t) and (u).

One commentator questioned whether other presently installed gauges for other functions could be used as "indicators" to indicate the functioning of a heater as required in paragraph (v). As discussed above, in connection with the indicators required for oil strainers or filters, the FAA anticipates that the requirement will be met by installation of gauges to indicate the functioning of heaters. However, if a clear and positive indication can be obtained from other gauges used to portray functions different than direct heater functioning, the requirements of the section are met.

PART 25—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

Proposed changes to §§ 25.951 (Proposal 1), 25.997 (Proposal 3), 25.1015 (Proposal 5), 25.1019 (Proposal 6), and 25.1093 (Proposal 7) were the subject of comments substantially the same as submitted for the proposed like-numbered sections of Part 23. As adopted, these Part 25 sections set forth the same requirements as proposed in Notice 71–12 except as they have been modified for the reasons given in the preamble discussion of the like-numbered Part 23 sections.

Proposal 2—No comments were received in response to the proposed deletion of § 25.977(b). That paragraph is accordingly revoked and marked reserved.

Proposal 4—The exemption contained in the last sentence of § 25.1013(a), concerning fireproofing of an integral oil sump of less than 20-quart capacity on a reciprocating engine, has been removed from this section and placed in § 25.1183(a). This action involves no substantive change and achieves consistency with the parallel Part 23 section.

Proposal 8—Section 25.1183(a) has been further amended in connection with changes to § 25.1013(a) as noted under Proposal 4.

Proposal 9—Section 25.1305(c) has been amended so that it is substantively the same as the parallel provision of § 23.1305. The related Part 23 preamble discussion is applicable. The proposed new subparagraph 25.1305(d)(3), concerning an indicator to indicate rotor system unbalance, has already been adopted by a separate rule-making action (Amdt. 25–35, 39 F.R. 1831).

One commentator stated that aircraft fuel systems have been designed without cockpit controlled fuel heat; therefore there is no need in proposed subparagraph (c)(8) for an indicator to indicate the proper functioning of any fuel heater. The section however only requires an indicator if a heater is used and the FAA believes it would supply necessary information to indicate heater functioning.

PART 27—AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT

Proposed changes affecting §§ 27.951 (Proposal 1), 27.997 (Proposal 2), 27.1013 (Proposal 3), 27.1015 (Proposal 4), 27.1019 (Proposal 5), 27.1093 (Proposal 6), 27.1183 (Proposal 7), and 27.1305 (Proposal 8) were the subject of comments substantially the same as submitted for the proposed like-numbered sections of Part 23. The proposed amendments set forth in Notice 71–12 have been adopted except as explained in the preamble discussion of the like-numbered Part 23 sections.

PART 29—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY ROTORCRAFT

Proposed changes affecting §§ 29.951 (Proposal 1), 29.997 (Proposal 2), 29.1013 (Proposal 3), 29.1015 (Proposal 4), 29.1019 (Proposal 5), 29.1093 (Proposal 6), 29.1183 (Proposal 7), and 29.1305 (Proposal 8) were the subject of comments substantially the same as submitted for the proposed like-numbered sections of Part 23. The proposed amendments set forth in Notice 71–12 have been adopted except as explained in the preamble discussion of the like-numbered Part 23 sections.

PART 33—AIRWORTHINESS STANDARDS: AIRCRAFT ENGINES

Proposal 1—The comments received in response to proposed § 33.5 focused principally on the overhaul instructions that would be required by paragraph (e). The comments revealed widespread misunderstanding of the effect of requiring the engine manufacturer to set out the frequency of overhauls. In this connection, the FAA wishes to point out that overhaul instructions are necessary upon type certification because an engine might require overhaul at any time thereafter, and the ability to perform an overhaul should not be limited by lack of instructions. Furthermore, the manufacturer's statement of overhaul frequency is not established as an operating limitation but operates merely as a recommendation; it does not preclude the establishment of different overhaul intervals, nor does it preclude the "piecemeal" overhaul practice followed by operators using continuous airworthiness maintenance programs. It should be noted, however, that the initial overhaul time established under § 33.90 and referred to in § 33.7(c)(17) is an operating limitation that must be complied with regardless of the adoption of any other practice; the initial overhaul, whether accomplished "piecemeal" or otherwise, must be completed within the time established.

With regard to a question raised by one commentator concerning the requirements in § 33.5(e)(2) that certain component life limits be specified in the required instructions, the FAA wishes to call attention to the fact that no separate requirement is thus established that would have any effect on operators of the engines. The life limits of all components requiring replacement are established under other sections of Part 33 as operating limitations that must be complied with, and their publication in the required instructions is a convenience to operators.

Upon further review, § 33.5(a)(1) is revised to include a requirement that the installation instructions contain the maximum allowable loads for engine mounting attachments and related structure, which are required to be determined in complying with § 33.23. Similarly, § 33.5(a)(2) is revised to include a requirement for description of the pipes, wires, cables, ducts, and cowling covered by that section. That information is considered essential for installation, and FAA practice has been to require it for compliance with prior §33.5.

Proposal 2—The effect of proposed § 33.7 was misunderstood by a number of commentators who objected to various ratings and limitations listed therein. Contrary to the apparent belief of those commentators, no ratings or limitations would be established independently under § 33.7; the section merely contains a list of ratings and limitations established either under applicable requirements of Part 33 that predate the Notice, or under proposed new requirements contained in the Notice. Consideration was thus given to the substance of the comments as they related to substantive requirements proposed in the Notice. Discussion of comments directed to § 33.7 but relating to proposed new requirements is found with other comments under the appropriate section. However, as a result of such comments, one substantive change has been made that affects § 33.7; no rating or limitation need be established for turbine engine internal cooling air flow, and proposed § 33.7(c)(12) has therefore been deleted, with attendant necessary renumbering of the succeeding subparagraphs. Other changes of an editorial nature have been made for internal consistency between § 33.7 and other Federal Aviation Regulations.

Proposal 3—No public comment was received on the proposed deletion of § 33.13, and the section has been revoked and marked "reserved."

Proposal 4—Several comments were received that contained objections to the start-stop stress cycle described in proposed § 33.14 as not being representative of a typical operating cycle that would produce the stresses to be accounted for by the requirement. In particular, there was objection to the requirement that disc and spacer temperatures be stabilized after stopping the engine in order to complete a cycle. The FAA agrees that final temperature stabilization should not be necessary where an applicant can show that the components experience the complete stress range without such stabilization, and the definition of a start-stop stress cycle as adopted includes a provision to allow for such a showing.

Another commentator suggested that the operating limitation be defined as the number of cycles to a detectable crack rather than to failure. The FAA regards a crack as a failure and the rule as adopted applies not only to cracks but to other types of failures which may occur prior to the occurrence of a detectable crack.

A commentator recommended that spacers be deleted from the section because they would not normally be critical. The FAA disagrees; spacers are a critical item in low cycle fatigue, and the requirement, in this regard, is adopted as proposed.

One commentator stated the belief that the establishment of component life limits would result in a complicated and time-consuming process for extending component life. The FAA points out that the listing of this limit on the type certificate as required by this section provides only an initial limit and will not in any way complicate the procedure for extending the limit. In this connection, the section as adopted is revised to clarify that the required operating limitations and the provision for increasing them apply individually to each rotor disc and spacer.

Proposal 5—Several commentators objected to the new standard of protection proposed in § 33.17(b) for external lines, fittings, and components as necessary because the matter is adequately covered in paragraphs (a) and (c) of that section, while another commentator asserted that, due to considerations of airflow and venting, the requirement should be imposed only on the airframe. The FAA does not agree with these positions. The new requirement in (b) for protection against ignition of leaking flammable fluids is necessary to deal with possible impingement of such fluids on hot surfaces. Furthermore, since engine design necessarily includes considerations of airflow and venting, this requirement in Part 33 will assure that those considerations take account of possible ignition of leaking flammable fluid that could result from its impingement on engine components.

In response to comments questioning the applicability of proposed § 33.17(c) to integral oil sumps on the smaller reciprocating engines, the requirement as adopted is revised to exclude such sumps having less than a 20-quart capacity. The requirement is thus made consistent with the parallel requirements in the aircraft airworthiness parts.

One commentator believed that a clear definition of "fireproof" and "fire resistant" was lacking in the regulations and suggested that temperature, duration and flame intensity should be specified as part of any definition. The definitions in § 1.1 of the regulations include both "fireproof" and "fire resistant" and any further changes to these definitions would be outside the scope of the Notice.

One commentator questioned whether under paragraph (e), the accumulation of fluid is interpreted as occurring inside of the engine and suggested that the section should specify unwanted flammable fluid. The FAA agrees that the section is intended to refer to unwanted flammable fluid and is directed to areas internal to the engine. The requirement as adopted is reworded accordingly.

Proposal 6—The comments received in response to proposed § 33.25 expressed general agreement with the intent of the requirement as understood by the commentators. However, several of the comments indicated a need for clarification regarding the applicability of limit loads to accessory drives and mounting attachments. The FAA agrees that the intent of the proposal was that the limit load requirement apply to accessory drives and mounting attachments and the section as adopted is reworded to make this clear.

In addition, as suggested by one commentator, a provision has been added to make clear that the use of engine oil for lubrication of accessory drives and mounting attachments is permitted, with appropriate sealing provisions.

Proposal 7—It was pointed out that reference to "excessive speed, temperature, and vibration" in proposed § 33.27(a) was vague in view of the very specific requirements in proposed paragraph (d). Since it was the intent of the proposal to relate the two requirements, § 33.27(a) as adopted is revised to clearly refer to the specific tests included in the section.

Several commentators objected to the speeds proposed in the overspeed tests required in § 33.27. They expressed the opinion that the rotor speed strength demonstrations which are currently accepted by the FAA and which are 5 percent lower in all cases than the proposed requirements demonstrate an adequate margin of strength.

In this connection, one commentator pointed to 6 million hours of service experience with no disc bursts. The FAA finds compelling merit in these comments and upon further consideration the overspeed requirements as adopted are 5 percent less than those proposed.

Several commentators believed that the proposal to use a test article fabricated with minimum qualities allowed by the specification was an impractical requirement. They expressed the opinion that to conform to the proposal as written would require a component made with all the minimum properties of the specifications, a condition which could not be met. The FAA agrees with these comments and upon further consideration has deleted the proposal.

Several commentators objected to the proposed paragraph (c) of § 33.27 regarding cooling airflow as being too restrictive. They pointed out that in designs where there is more than one cooling passage, one passage could be blocked and still allow passage of an adequate flow of cooling air. While this might be less than normal cooling airflow it might still ensure adequate cooling. The FAA agrees that the proposed requirement would not accomplish the intended purpose and, in connection with the deletion of other proposed requirements relating to cooling airflow that were determined to be impracticable (see discussion relating to §§ 33.7 and 33.87), the section is adopted without the proposed paragraph (c).

Proposal 8—One commentator expressed the opinion that the instrument connection markings required in proposed § 33.29 would be unnecessary if it could be shown that there was no possibility of an instrument being connected to the wrong connection. The FAA agrees that this would satisfy the requirements of the rule and, accordingly, the section as adopted is revised to specifically allow this. In addition, the section has been revised by deletion of the word "new" which was inadvertently included in the proposal, to clarify that it applies to all engine limitations.

The proposed requirement relating to rotor system unbalance contained in proposed § 33.29(b), as noted previously in this preamble, has been adopted in a separate rule-making action (Amdt. 33-5; 39 F.R. 1831).

Proposal 9—The only public comment received in response to the proposed new § 33.42 recommended deletion of the requirement but gave no reason for the recommendation. The section is adopted as proposed.

Proposal 10—A comment was received that questioned the speed range that would be applicable to the proposed requirement in § 33.43(a) for a vibration survey with a cylinder not firing. As proposed, the requirement implies the same speed range that is applicable to the engine with all cylinders firing. The FAA agrees that this would be impractical and the requirement is revised to specify that the applicable speed range is from idle to maximum desired takeoff speed rating.

Several commentators questioned whether the vibration test survey specified in paragraph (a) required the same propeller used for the endurance test or a propeller of the same configuration. The FAA intended that the same configuration of propeller could be used for the tests and the rule as adopted is revised to clarify the intent for both propellers and loading devices.

One commentator recommended that § 33.43(a) be revised to exclude the propeller shaft or other output shafts from the vibration survey. The FAA does not agree that they should be excluded since they are the most vital components requiring vibration measurements and tests. However, this does not include any accessory drive shafts, which are required to be loaded under § 33.43(c) in order to assess the effects of such loads on the propeller or other output shaft.

One commentator regarded that the number of cycles to demonstrate compliance for fatigue testing of steel shafts specified in § 33.43(b) should be 10 million rather than 10½ million cycles. The FAA agrees that 10 million cycles represents an accepted standard and the requirement is revised accordingly.

A commentator recommended that § 33.43(c) which requires accessories to be loaded during the vibration tests be deleted as being unnecessary for torsional surveys. The FAA does not agree; the purpose of the test is to disclose possible adverse vibration effects, including any that might be contributed by accessories.

Proposal 11—Several commentators objected to the proposed § 33.45(b) requirement for a recalibration after the endurance test as being impracticable and unnecessarily adding to the endurance test. They suggested that the intent of the section, to ensure that any power loss during the endurance test be determined, could be met by modifying the rule to require a "power check" in place of a recalibration. The FAA agrees that a full recalibration is not required to determine power loss and the section is revised to require a power check in place of a recalibration. In addition, since the section permits use of measurements taken during the final portion of the endurance test, reference to the finish of that test has been deleted.

Proposal 12—Upon further consideration, the parenthetical statement in the first sentence of paragraph (a) of proposed § 33.49 is revised to clarify that the additional testing requirements that apply to a turbosupercharger are completely covered in § 33.49(e)(1)(iii) (proposed § 33.49(e)(1)(iv)). An applicant may elect to run the engine-turbosupercharger combination an additional 50 hours in complying with that requirement, but it is not necessary to do so.

One commentator felt that in § 33.49, the accessory loading provision referred to in paragraph (a) could be interpreted to require the limit load to be applied during all operations. The intent of this rule is to require limit loads only during operation at rated maximum continuous power and rated takeoff power, and the section is revised accordingly.

One commentator recommended that instead of requiring maximum cylinder temperatures during all of the endurance running at maximum and takeoff powers that a shorter time period would adequately demonstrate cylinder assembly integrity. The FAA agrees with the recommendation and the rule as adopted requires testing with cylinder and oil inlet temperatures specified, for 35 hours, the time currently used in certification practice. Furthermore, the FAA agrees with another commentator that as long as the cylinder temperatures are monitored the intent of the section will be met, and the requirement is revised to refer to cylinder temperature, deleting reference to the cylinder barrel and head.

A commentator recommended that the altitude testing requirements for turbosupercharged engines be deleted and the tests be run at sea level condition. The FAA does not agree. The altitude testing requirements are necessary. However, the section as adopted is revised by rewording the lead-in sentence of § 33.49(e) to allow as an alternative that altitude tests may be simulated, and by deleting proposed § 33.49(e)(1)(iii).

Proposal 13—Several commentators objected that the proposed requirement in § 33.55(b) that all adjustment settings and functioning characteristics that can be established independent of installation on the engine be unchanged at teardown is unnecessarily restrictive. The FAA agrees that the intent of the proposal would be satisfied if those functioning characteristics remain within limits established at the beginning of the endurance test, and the requirement is revised accordingly.

Several commentators believed that the requirement proposed in § 33.55(c) that components conform to the type design after the endurance test was too severe, especially since this would require parts to remain within drawing tolerances. The FAA does not agree. The type design includes dimensions within which a component may change in service. A component that sustains wear beyond those limits during a 150-hour endurance test has not met minimum airworthiness standards.

Proposal 14—The last sentence of § 33.57(b) as proposed is amended to require the engine "or" its parts to be subjected to additional tests if required instead of the engine "and" its parts.

As discussed in connection with Proposal 1 of Part 21, new § 33.62 is added to require stress analysis of certain engine parts.

Proposal 15—A commentator recommended revision of proposed § 33.65 to include reference to the allowable engine operating limitations in order to clarify that there could not be a finding of noncompliance if any of the undesired effects resulted from operations beyond those limitations. The section is intended to apply only to operations that are within allowable operating limitations as set forth in the manufacturer's operating instructions and the requirement is revised to make this clear.

In addition, the section is revised to delete the reference to inlet air distortion caused by cross-wind, which is adequately covered by the manufacturer's specification of limiting inlet air distortion, and to ice ingestion, which is adequately covered by other requirements.

Proposal 16—Several commentators recommended that § 33.66 be clarified to avoid the interpretation that a reduction in engine performance due to bleed air would be an "adverse effect on the engine." To preclude this possible misinterpretation, the section is revised accordingly.

Proposal 17—Several commentators suggested that paragraph (a) of § 33.67 be revised to allow for the use of seals and locking devices as alternatives to making the fuel control adjusting means inaccessible. The FAA agrees that these alternative means be used to achieve the desired intent and the section is revised accordingly.

Several commentators expressed doubt that it should be necessary to add any water to saturated fuel since upon cooling the saturated water would precipitate out, thus representing the most critical condition. The FAA does not agree that the amount of water which may precipitate out properly represents the most critical amount of free water possible in the system. The added water is necessary to simulate critical conditions.

Several commentators expressed doubt that § 33.67(b)(6) could be literally complied with and suggested that the aim of the rule was that all means be taken to prevent the release of contaminants, and that an insignificant amount of contaminant release should not violate the rule. The FAA agrees with this comment and the rule as adopted requires design of the bypass to minimize release of contaminants.

Other revisions to the section have been made for the reasons set forth in the discussion relating to § 23.907, which contains like requirements.

Proposal 18—The comments received in response to proposed § 33.68 were similar to those received in connection with the substantively similar provisions contained in Proposal 6 of Part 23, § 23.1093. The section is revised in accordance with the discussion pertaining to revisions of that section.

Proposal 19—Several commentators objected to the requirement in § 33.69 for two igniters; however, this is the requirement of the present rule and the only proposed change to the rule is the requirement for a single igniter for fuel augmentation systems. No objections were received to this provision.

Proposal 20—Several commentators objected to the requirement in § 33.71(b)(6) for cockpit indication of oil filter contamination, where no bypass is incorporated. However, the FAA considers the addition of a cockpit indicator to be necessary in the interest of safety in order to enable the flight crew to prevent engine failure due to oil starvation, that might occur if all required filters in the lubrication system do not incorporate the protection of a filter bypass.

As indicated by other commentators, the words "extreme temperature" as used in proposed § 33.71(c)(9) could be taken to require compliance at temperatures beyond the intended operating range. Such a result would be contrary to the intent of the requirement and the section as adopted is revised to refer to maximum operating temperature. In response to other comments the differential pressure requirement in subparagraph (c)(9) is reworded to clarify that it may not be less than 5 p.s.i. above the maximum operating pressure of the tank.

One commentator considered that the lack of a requirement for a bypass was a serious deficiency in the proposal. The FAA has considered this question many times including extensive discussion at government-industry airworthiness meetings and has determined that due to the serious divergence of opinion the use of a bypass should at present be optional. If no bypass is used, however, the applicant must comply with other safeguards contained in the section to ensure safe operation of the lubrication system.

The remainder of the comments were similar to those made in response to Proposals 3, 4, and 5 of Part 23 and have been responded to in discussion of those proposals. The section has been reworded in part to conform with the changes made to the sections involved in those proposals.

Proposal 21—One commentator recommended that § 33.72 should refer to a "main" filter only. The FAA does not agree; the requirements are meant to apply to each filter or screen incorporated in the system.

Proposal 22—Several commentators believed that § 33.75 as written was confusing and ambiguous. The printed notice was incorrectly worded and the section is rewritten to read correctly.

Several commentators suggested that the word "burst" in subparagraph (b) was ambiguous and needed further definition. The FAA agrees and, accordingly, a further descriptive phrase, "penetrate its case," is added.

One commentator suggested that the phrase "improper operations" be substituted for "bad operation". The FAA agrees with the suggestion and the section incorporates this change.

One commentator objected to consideration of multiple failures, to avoid consideration of an infinite number of possible failures. The analysis however does not require that all possible multiple failures be considered, but uses the accepted standard of consideration of only the probable single or multiple failures.

Proposal 23—One commentator suggested that § 33.77(a)(2) be clarified to ensure that a burst meant uncontained burst that penetrates the case. The FAA agrees that this is the intent of the section and it is revised accordingly.

Several commenators suggested that the footnote to the table be modified to permit the option of demonstrating containment on a component basis for all the test items. The FAA does not agree that this would adequately account for secondary effects except in the case of blade containment in fan engines as noted.

Several commentators expressed doubt that the proposed rate of ingestion of 1½ pound birds was supported by ornithological data or actual flight experience. They suggested that a lesser rate be used. The FAA, after further study and consideration, agrees. Accordingly, the ingestion rate of 1½ pound birds is established at one for the first 300 square inches of inlet area and at one for each 600 additional square inches or fraction thereof, of up to a maximum of 8 birds.

The practical reality of a 4-inch hailstone was questioned in some of the comments. The FAA, after further study, has determined that this size will probably not be encountered in actual flight conditions and the section is amended to delete the requirement.

Several commentators believed that the amount of sand and gravel specified was excessive and not representative of actual conditions. After further consideration, the FAA agrees that the amount proposed should be reduced and the section is revised accordingly.

The FAA agrees with the point raised by several commentators that, in § 33.77(c), some power or thrust loss should be permitted since the ingestion of these objects will certainly cause a temporary power loss. Accordingly, the requirement is revised to permit power or thrust loss that is not "sustained." In addition, § 33.77(f) is revised, upon further consideration, to require testing of water ingestion to take place under takeoff operating conditions rather than the proposed "maximum cruise." This reflects current practice in engine certification.

The ¼ by 1 inch bolt test is deleted since the test for the broken rotor blade is a more stringent test and will adequately account for the effects of the bolt.

A comment was received that objected to the provision in proposed § 33.77(d)(3) relating to obstruction of induction airflow by foreign objects that are stopped by a protective device. The FAA wishes to point out that the subject provision does not state a requirement that must be met by all applicants. Rather, it provides an alternative to testing for the effects of objects that can be stopped by a protective device and prevented, by deflection out of the airflow path or by some other means, from obstructing the induction airflow in any way.

In addition, a new paragraph (e) is included in § 33.77 to incorporate the suggestion offered by some commentators that the effects of ingestion of some foreign objects can be accounted for by the effects of others. Thus, in showing compliance with § 33.77 (a) the applicant is required to test only for that object that is shown to have the most severe effect. Similarly, for compliance with (b), testing is required for sand and gravel and either the 3 ounce or 1½ pound birds, depending on the size of the engine inlet, as designated in § 33.77(f).

Proposed paragraph (e) is redesignated as paragraph (f).

Proposal 24—One commentator recommended that in § 33.79(a) an acceptable means of compliance to demonstrate cooling be provided for the guidance of the applicant. The FAA, upon further consideration agrees that the section does not adequately establish a definable objective and the proposal is withdrawn for further study. Proposed paragraphs (b) through (f) are redesignated (a) through (e), respectively.

One commentator believed that paragraph (e) of the proposed rule could be misinterpreted as allowing a loss of thrust to the unaugmented engine in an amount equal to that added by the augmentor. To avoid possible misinterpretation, the requirement, adopted in § 33.79(d), is reworded to clarify that the loss of thrust mentioned means only the thrust that is provided by augmentation. Furthermore, upon further consideration, the FAA has revised the requirement to refer only to failure or malfunction of augmentor combustion, since the effects of other possible augmentor failures on engine thrust cannot be reliably predicted.

One commentator recommended clarification of proposed paragraph (f) to ensure that the rotational speed mentioned be the minimum rotational speed at which the thrust augmentation functions. This is the original intent of the paragraph and it is modified accordingly.

Proposal 25—One commentator pointed out an error in th eexplanation of proposed changes to § 33.81. Instead of referring to § 33.43, it should have referred to § 33.87. No change to the adopted rule itself is necessary, however.

Proposal 26—No comments were received on the proposed new § 33.82, and the section is adopted as proposed.

Proposal 27—Several commentators recommended that the requirement in § 33.83 for testing to 110 percent of the desired maximum continuous speed rating be deleted because certain high performance turbine engines may not be capable of achieving this overspeed condition. Upon further consideration, the FAA agrees with the commentators' position and the requirement is deleted.

Other revisions to the section have been made for the reasons set forth in the discussion relating to § 33.43, which contains like requirements.

Proposal 28—Revisions have been made to § 33.85 for the reasons set forth in the discussion relating to § 33.45, which contains like requirements.

Proposal 29—Several commentators requested that the surface temperature requirement be deleted from proposed § 33.87(a)(3) as being difficult to simulate on a test stand. The section is intended by the FAA to require that if an engine external temperature limit be specified by the applicant as being critical, then the applicant must demonstrate satisfactory operation at that temperature. It is pointed out that only those temperatures specified by the applicant need be held at their specified values and the requirement is reworded to clarify this. In addition, the section is revised to provide allowance for more than one test run if all parameters cannot be held at the required values simultaneously.

Several commentators objected to subparagraph (a)(4) of § 33.87 which had called for fuels, lubricants, and hydraulic fluids with the lowest thermal breakdown temperatures allowed by their specifications to be used during the tests . They felt that this was practically an impossible requirement because of the unavailability of fluids and lubricants with all the minimum properties called for. The FAA agrees, and the requirement is revised to call for specified fluids and lubricants used during the endurance tests to conform to their respective specifications.

One commentator suggested that § 33.87(a)(6) be amended to require that only shear and overload loads be tested and that the requirement for other loading during the endurance tests be deleted. The FAA does not agree, but intended that the endurance test simulate actual operation and include testing of the accessories drives themselves as well as other portions of the engine. This requires loading of those drives, and the rule is adopted as proposed.

Several commentators questioned whether the limit load for accessories specified in subparagraph (a)(6) should apply only during maximum power operation. This is the intended construction of the section, and it is amended to reflect this intent.

One commentator expressed concern that compliance with § 33.87(a)(8) which calls for cooling air simulation could not be demonstrated since in a particular engine there may be many divisions of cooling air-flow which might make it virtually impossible to individually regulate each separate cooling airflow path. The FAA agrees with the commentator's position and the proposal is withdrawn for further study.

Several commentators suggested that the references to supersonic engines be deleted because of the lack of foreseeable need for such engines. The FAA does not agree. One of the purposes in formulating these new amendments is to establish standards for that new generation of engines, especially since the FAA is in the process of presently certificating such engines.

One commentator pointed out that the proposal did not include the false start tests of the present rule. This was an inadvertent omission and those false start tests are included in the adopted rule.

Proposal 30—The phrase "for installation in an engine" is deleted from § 33.88 as being surplusage.

Proposal 31—One commentator requested that a better definition be used in § 33.89 (b) for the term "extreme ambient temperature and altitude." The FAA agrees that, taken literally, the requirement could be unnecessarily burdensome. Accordingly, the wording is modified to read "maximum and minimum operating ambient temperature" and "maximum operating altitude." In addition, upon further consideration, the last sentence of the proposed requirement is deleted as unnecessary.

Proposal 32—One commentator believed that for the overhaul test of § 33.90 two starts per hour was unnecessarily severe and suggested that a number representative of intended operation might be substituted for the stated requirement. The FAA agrees that if the applicant could show that a lesser number of starts would be more representative of intended operation for the particular engine that this would adequately comply with the intent of the section, and the section is revised accordingly. Furthermore, since this revision eliminates the distinction in the section between airplane and rotorcraft engines, the requirement is expressed in a single paragraph, rather than in (a) and (b) as proposed.

In response to several comments, § 33.90 as adopted is revised to clarify that the requirement applies only to engines being originally type certificated; it does not apply to engines being certificated through amendments to existing type certificates or through supplemental type certification procedures.

Several commentators recommended deleting the entire section as proposed. They expressed the opinion that it was unreasonable to require the completion of an overhaul test in addition to the endurance test as a condition of type certification and believed that past practices were adequate to establish an initial overhaul period. One commentator stated that the 150 hour endurance test, because of its accelerated nature, should be equivalent to a 1000 hour overhaul period. The FAA does not agree. This additional overhaul test is necessary since experience on certain engines has shown that the endurance test has not been equivalent to longer service operations, especially for periods as long as 1000 hours.

Proposal 33—Several commentators pointed out that the oil tank requirement in paragraph (c) of proposed § 33.91 was redundant with a similar proposed requirement in proposed § 33.71(c)(9). The specified test requirements for oil tanks are covered under § 33.71(c)(9) and reference to oil tanks is, therefore, not included in § 33.91(c) as adopted. References to "extreme temperature" and "the sum of 5 p.s.i. and the maximum operating pressure" in the requirements specified in § 33.91(c) have been revised for reasons discussed in connection with Proposal 20, this Part (§ 33.71). In addition, and for the same reason, references to "extreme temperature" in § 33.91(d) have been replaced by "maximum and minimum operating temperature", and the requirement to test while cycling operating conditions from "one extreme to another" has been rewritten to require cycling between maximum and minimum operating conditions.

Proposal 34—Several commentators expressed the opinion that the tests required under § 33.92 are unnecessary for engines that are to be used in single engine aircraft. One commentator further suggested that the time period of 3 hours may not be appropriate to a practical situation but rather, the time period and r.p.m. should be based upon the conditions arising from a recommended flight technique following an engine failure at a critical point in the flight path. Another commentator expressed doubt that windmilling for 3 hours without oil was a normal expectancy. The FAA does not agree. It is not possible, at the time of certification, to know the end use or particular intended flight conditions for each engine. It is therefore necessary to establish a general criterion which will adequately demonstrate a degree of safety for conditions that a turbine engine would likely encounter on a typical and usual route structure. The 3 hour time period specified does represent a time period representative of an expected route structure and windmilling for 3 hours without oil is a reasonable possibility.

One commentator recommended that the proposed rule be clarified to specifically allow for the engine windmilling speed to either decrease or stop due to freezing of bearings. The proposal as written does not specifically mention this condition. However, the FAA agrees that this would be a satisfactory means of accomplishing the intent of the section and the rule is revised to allow for this condition.

One commentator recommended deletion of the entire section because he believed there was insufficient experience pointing out a need for these tests and because the proposal implies a flight test as a condition of engine certification. The FAA finds that experience establishes the need for these tests and points out that flight tests are not specifically required by the rule.

Proposal 35—The changes to § 33.93 are similar to those made for § 33.55, which was the subject of similar comments. The changes and comments are discussed in connection with Proposal 13, this Part.

Proposal 36—The changes to § 33.99 are similar to those made for § 33.57, which was the subject of similar comments. The changes and comments are discussed in connection with Proposal 14, this Part.

Finally, it should be noted that a number of the rule changes contained in this amendment deal with subjects for which proposals were received for inclusion in the 1974-75 Airworthiness Review Program (Notice 74-5; 39 F.R. 5785). As indicated in that Notice and in Notice 74-5A (39 F.R. 18662), inviting comment on the proposals received, rule making procedures separate from the Airworthiness Review could result in removal of proposals from further consideration during the Airworthiness Review Program. The FAA has determined that the following FAA proposals presently being processed in the 1974-75 Airworthiness Review relate to issues that are covered by the rules adopted by these amendments, and need not, and will not, be given further consideration during the 1974-75 Airworthiness Review:

Proposal No.	*FAR'S*	*Subject*
677 (with respect to proposed paragraph (q) only)	§ 23.1305	Powerplant instruments
752	§ 25.997	Fuel strainer or filter
784	§ 25.1305	Powerplant instruments
863	§ 27.1305	Powerplant instruments
941	§ 29.1183	Lines and fittings
947	§ 29.1305	Powerplant instruments

These amendments are made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

In consideration of the foregoing, Parts 1, 21, 23, 25, 27, 29, and 33 of the Federal Aviation Regulations are amended as follows, effective October 31, 1974.

Amendment 21–41

Parts Manufacturer Approvals

Adopted: November 27, 1974 **Effective: January 4, 1975**

(Published in 39 F.R. 41964, December 4, 1974)

The purpose of this amendment to Part 21 of the Federal Aviation Regulations is to delete the requirement that a person who holds a Parts Manufacturer Approval (PMA) must be the manufacturer of the part covered by the PMA.

This amendment is based on a Notice of Proposed Rule Making (Notice No. 74–24) published in the Federal Register on July 1, 1974 (39 F.R. 24236). Numerous comments were received in response to the Notice, and the FAA's disposition of comments is discussed below.

The proposals contained in Notice 74–24 had the following three major objectives:

(1) To permit PMA's to be issued to, and retained by, persons not engaged in any of the manufacturing involved in the production of the parts covered by the PMA.

(2) To continue the requirement that the FAA be provided a list, maintained current within ten days, of the name and address of each facility at which manufacturing involved in the production of the part would be accomplished, and to clearly state that the FAA's authority under § 21.303 to make any inspections and tests necessary to determine compliance with the applicable regulations includes those that the FAA determines need to be conducted at any manufacturing facility.

(3) To provide for specific FAA approval of PMA Fabrication Inspection Systems (FIS's).

There was only a single comment, containing no supporting information or arguments, opposed to the first objective. Accordingly, to meet that objective, § 21.303(a) is amended to require only that the person producing a modification or replacement part do so pursuant to a PMA. This will permit PMA's to be issued to any person who establishes and maintains a FIS under which the part is produced whether or not that person is the manufacturer.

A large number of the commentators objected to the proposals that would implement the second two stated objectives. In general, those objecting to the requirement that a list, current within 10 days, be maintained of all manufacturing facilities involved in the production of a part stated that there was ordinarily a rapid turnover of subcontracting facilities and that the proposed requirement would be an unnecessary paperwork burden for both PMA holders and the FAA. Furthermore, many of those objecting expressed concern over the expected reaction of many subcontractors and suppliers to any requirement that their facilities and operations be made available for inspection by the FAA. It was alleged that those subcontractors and suppliers because of the relatively small volume of business involved, would refuse to do business with PMA holders under such constraints. In addition, many of those commentators expressed concern that subcontractors and suppliers would react in a similar manner if required to implement a PMA holder's FIS in connection with the production of items to be delivered to the holder.

These comments reflect a misunderstanding of both the present rule and the proposals contained in the Notice. The proposals relating to maintaining a list of manufacturing facilities, to inspections conducted at any manufacturing facility, and to implementation of a PMA holder's FIS at any manufacturing facility did not include new substantive requirements. Section 21.303(c)(2) requires an applicant for a PMA to submit the name and address of the manufacturing facilities at which the parts are to be manufactured, and § 21.303(j) requires the PMA holder to notify the FAA within 10 days of any changes in the location of those facilities, including additional facilities. Furthermore, § 21.303 provides that the Administrator may make any inspections and tests necessary to determine compliance with the applicable FAR's. While it may be possible in many cases to conduct all of the required inspections and tests at the PMA holder's facility, the FAA pursuant to its responsibilities under the Federal Aviation Act, must retain the right to perform inspections and tests at any facility utilized in production under a PMA. With regard to implementation of a PMA holder's FIS at any manufacturing facility, it should be noted that § 21.303(h) prior to this amendment stated that "Each person manufacturing . . . parts under a Parts Manufacturer Approval shall establish and maintain a fabrication inspection system that ensures that each part conforms to the design data and is safe for installation on type certificated products . . ." That provision specifically required, among other things, determination of the condition of incoming materials, inspection of parts in process at points where accurate determination of conformity can be made, and segregation of rejected materials and components. The revision of paragraph (h) adopted by this amendment makes clear the present requirement that the PMA holder shall establish and maintain an FIS which assures that parts manufactured under that FIS conform to the design data, and are safe for installation on type certificated products. Thus, under both the current rule and this amendment the PMA holder has the responsibility of ensuring that all of the manufacturing is accomplished in accordance with his FIS. The revision makes no change with respect to the standards that the FIS must meet or the inspections and procedures that may be necessary to implement the FIS. Contrary, however, to the belief expressed by some commentators with respect to implementing an FIS, the FAA does not agree that the requirements can be met as to all PMA parts without some required FIS inspections being conducted at supplier manufacturing facilities. Furthermore, it should be noted that nothing in the rule prevents a PMA applicant or holder from adopting, as part of its FIS, the inspection or quality control system of the person performing the manufacturing if the system meets the requirements of the regulations.

Most commentators had no objection in principle to the proposals related to FAA approval of FIS's. A number of them, however, expressed the opinion that the FIS requirements should be made as consistent as possible with the requirements applicable to other FAA production approvals. The FAA agrees. Accordingly, those proposals are withdrawn for further study and future rulemaking action.

In addition to commenting on the changes to the regulations proposed by the FAA in Notice 74–24, a number of commentators requested other changes pertaining to FAA design and production approvals, including revision of the regulations (1) to require all applicants for PMA's to submit the design data, test reports, and computations necessary to establish that the design of the part meets the applicable airworthiness requirements, by deleting from § 21.303(c)(4) the provision permitting the use of the comparative method of establishing conformity to the design data; (2) to require full and accurate identification of PMA parts, units or assemblies incorporating PMA parts, and that such information be entered in the maintenance records of the aircraft and aircraft engines in which the parts are installed; and (3) to permit the holders of other FAA production appropals to use the statistical quality control procedures now authorized for PMA holders in § 21.303(h)(5), or to delete such authorization from that section.

The FAA appreciates all comments received in response to Notice 74–24 and they will be considered in the FAA study referred to above.

Finally, it is noted that some commentators expressed interest in a public hearing prior to FAA action on certain of the proposals contained in Notice 74–24. Inasmuch as this amendment does not adopt any of the proposals to which those persons objected, such a hearing is unnecessary.

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

In consideration of the foregoing, and for the reasons set forth in Notice 74–24 except as modified herein, Part 21 of the Federal Aviation Regulations is amended, effective January 4, 1975.

Amendment 21-42

Noise Standards for Propeller Driven Small Airplanes

Adopted: December 31, 1974 **Effective: February 7, 1975**

(Published in 40 F.R. 1029, January 6, 1975)

The purpose of these amendments is to prescribe noise standards for the issue of normal, utility, acrobatic, transport, and restricted category type certificate for propeller driven small airplanes; to prescribe noise standards for the issue of standard airworthiness certificates and resticted category airworthiness certificates for newly produced propeller driven small airplanes of older type designs; and to prohibit "acoustical changes," in the type design of those airplanes, that increase their noise levels beyond specified limits.

The primary basis for these amendments is § 611 of the Federal Aviation Act of 1958 (49 U.S.C. 1431), as amended by the Noise Control Act of 1972 (P.L. 92-574).

These amendments are based on Notice 73-26, published in the Federal Register on October 10, 1973 (38 F.R. 23016). Interested persons have been afforded an opportunity to comment on the matters contained herein, and all relevant comments have been considered in the issuance of these amendments.

Pursuant to 49 U.S.C. 1431(b)(1), the Federal Aviation Administration has consulted with the Secretary of Transportation, concerning all matters contained herein, prior to the adoption of this amendment. Pursuant to that paragraph and § 1500.9(b) of the guidelines of the Council on Environmental Quality concerning statements on proposed Federal actions affecting the environment, published in the Federal Register on August 1, 1973 (38 F.R. 20550), the Federal Aviation Administration has consulted with the Environmental Protection Agency (EPA) and has submitted this amendment to that agency for review and comment.

A. *Background: Relation to Proposed Regulations Submitted to FAA by EPA.*

During the period of FAA consultation with EPA on this amendment, EPA transmitted to the FAA (on December 6, 1974), its proposed regulation concerning the noise of propeller driven small airplanes, pursuant to § 611(c)(1) of the Federal Aviation Act of 1958, as amended by the Noise Control Act of 1972 (P.L. 92-574). Section 611(c)(1) of the Federal Aviation Act of 1958 provides that EPA shall submit to the FAA proposed regulations to provide such control and abatement of aircraft noise and sonic boom as EPA determines is necessary to protect the public health and welfare. That section also provides that the FAA "shall consider such proposed regulations submitted by EPA under this paragraph and shall, within thirty days of its submission to the FAA, publish the proposed regulations in a Notice of Proposed Rule Making." Pursuant to that provision of law, a Notice of Proposed Rule Making, entitled "Proposed Regulations submitted to the FAA by the Environmental Protection Agency: Noise Standards for Propeller Driven Small Airplanes" is being issued by the FAA simultaneously with this amendment. A detailed project report, dated November 25, 1974, was also transmitted to the FAA by EPA to support its proposed regulations. Since receiving the EPA proposed regulation and supporting project report (and in view of the fact that this amendment, representing a year of FAA analysis and review of public comments in response to Notice 73-26, was ready for issuance when the EPA proposal was received), the FAA has conducted a comparative study of the EPA proposal (and its supporting project report), and the provisions of this amendment. This study was conducted to determine whether issuance of this amendment at this time would in any manner commit the FAA to a course of action that would conflict with an objective review of the EPA proposals under the procedures prescribed in § 611(c) of the Federal Aviation Act of 1958, or in any other way impair its ability to discharge its obligations under the Noise Control Act of 1972.

This review concentrated on the areas in which the EPA proposal may differ from this amendment with respect to the protection of persons from the noise of propeller driven small airplanes. The study, thus, concentrated on differences involving (1) the unit of noise measurement, (2) the compliance dates, (3) the noise levels for each affected airplane weight, (4) the climb performance correction procedure, (5) the treatment of agricultural and firefighting airplanes, (6) weight limitations derived from the noise compliance test, (7) the effect of wind on conduct of the noise test, (8) correction of test data for microphone losses, (9) the supplementing of field calibrations with the use of a voltage insert device, (10) the engine power that must be used, and (11) the methods of correcting acoustical and performance information. The review of these eleven areas was conducted in the light of EPA's supporting data in its Project Report.

Based on this review, the FAA is confident that there is no provision of the EPA proposals submitted on December 6, 1974, that could not be adopted later, as a supplement to this amendment, if justified on the basis of public participation and comment in response to the NPRM being issued simultaneously with this amendment, and in response to Public Hearings conducted on that NPRM. Furthermore, the FAA, by issuing this amendment at this time, has no way limited its ability or intent to respond fully to the corresponding EPA proposals in a manner contemplated by § 611(c) of the Federal Aviation Act of 1958.

In addition to preserving FAA's ability to take any action that may be shown to be valid under the § 611(c) process, this amendment reflects FAA's awareness of the need for timely action to protect the public from the noise of propeller driven small airplanes. This amendment, thus, establishes immediate criteria for the manufacturers of propeller driven small airplanes, consistent with the direction in § 611(b) that the public be protected from aircraft noise.

FAA's decision to issue this amendment at this time was coordinated with EPA. That agency stated that it had no objection to such issuance provided that it is understood that (1) this amendment may be changed on the basis of comments received in response to the EPA proposals (issued as an FAA NPRM simultaneously with this amendment) and (2) while EPA does not object to issuance of this amendment, it does not concur in the substance of this amendment.

EPA also requested that the FAA explain, in this preamble, its reasons for issuing this amendment at this time. These reasons are stated above, and may be summarized as follows: Considering the public need for timely action and the fact that all of the provisions of the corresponding EPA proposals that are shown to be valid can be fully and objectively considered for subsequent FAA rule making, the FAA believes that it would be contrary to the public interest, and to the intent of the Noise Control Act of 1972, to delay this immediately available regulatory action until the regulatory process prescribed in § 611(c) is completed anew with respect to the recent EPA proposals.

Finally, in response to Notice 73-26, EPA submitted, on December 20, 1973, its comments in the form of a comprehensive project report. This amendment is issued after analysis of that project report. A summary of FAA responses to that project report has been prepared in support of this amendment. However, since this earlier project report has been superseded by the later EPA proposal and project report, it is now moot. This summary has, therefore, been placed in the docket as history and is not recited in this preamble. To prevent confusion, and unless otherwise noted, all FAA responses to EPA's submittals in this matter will related to EPA's second project report (dated November 25, 1974) and its proposed regulation.

B. *Public Comments on Notice 73-26.* One comment stated that the acoustical change provisions of the proposed regulations would result in unwarranted constraints on operators of antique aircraft. It was argued that powerplant conversions of antique aircraft are necessitated by the unreliability of the original model engine or are desirable either to substitute alternate engines offered as original equipment by the manufacturer, or to achieve more performance. The FAA believes that, for antique aircraft that cannot achieve the noise limits of § F36.301(b) prior to the change in type design, no valid reason has been submitted for permitting further noise increases. If the antique aircraft is quieter than those limits prior to the change in type design, this amendment permits noise increases up to that limit.

In either case, the FAA will monitor the burden of the regulation on antique aircraft to determine if the problem of aging aircraft justifies further review of the noise limits proposed herein. The commentator also stated that the acoustical change proposal appears to prohibit powerplant conversions that do not involve issuance of a supplemental type certificate. It was stated that this would be an unwarranted burden on antique aircraft owners. The general answer to this comment is stated above. The commentator is correct in that the acoustical change provisions of this proposal apply to the issuance of any type design change approval, not only the issuance of supplemental type certificates.

One comment stated that it was not clear whether the proposed acoustical change provisions applied only to aircraft type certificates under the proposed rules, or whether they apply also to older aircraft. As stated in § 36.1(e), this amendment applies to the issuance of certain airworthiness certificates for new production versions of older aircraft types, not only to the issuance of new type certificates.

One comment stated that the acoustical change rules were proposed in such a manner that the tests required by Part 36, Appendix F, must be conducted by persons authorized to perform functions under Part 43 Maintenance, Preventive Maintenance, Rebuilding, and Alteration. This comment is not correct. The acoustical change provisions of Part 36 are limited by the terms of § 21.93 to changes in the type design of an aircraft. These provisions do not change, in any respect, the provisions of Part 43 concerning alteration of aircraft to conform to changes in type design that have already been approved. The acoustical change requirements in this amendment must be met, however, as a condition for the issuance of type design change approvals after the effective date of this amendment. The commentator also stated that no person has been identified as having noise compliance testing authority under Part 43. Since the approval of type design changes is the function of the Administrator or his designated representative, and is not the function of persons authorized to perform alterations under Part 43, it would not be appropriate, at this time, to designate persons under Part 43 to conduct the required tests.

One comment stated that the proposed acoustical change provisions place an expensive and time consuming burden on aircraft modifiers because of the required climatic conditions. This comment recommended that testing not be required unless there is "reasonable evidence" that the modification will result in noise levels exceeding the regulatory limit. The climatic conditions proposed within which no corrections for temperature and humidity are required cannot be expanded due to the need for consistent and reproducible results. The applicant has the choice of waiting for the test window, conducting the test in a more favorable climate, or correcting the data if the tests are conducted outside the "no correction test window." Further, the design changes which constitute an acoustical change for propeller driven small airplanes are delineated in § 21.93(b)(3). If the type design change is an "acoustical change" under the above section, the FAA believes that reasonable evidence does exist that modification may result in increased noise. For this reason, this amendment requires that the acoustical change compliance test be conducted.

One comment stated that the acoustical change provisions should only apply to aircraft exceeding a specified horsepower/propeller or horsepower/RPM combination. Section 21.93(b)(3) specifies the alterations that constitute an acoustical change. Because of the range of noise levels and propulsion systems addressed by this amendment, it would be unworkable to attempt to specify horsepower/propeller or horsepower/RPM combinations that would adequately describe the type design changes that may result in noise increases.

One comment stated that acrobatic aircraft should be excluded from the regulations on the same basis as agricultural and fire fighting aircraft since acrobatic aircraft also need all available horsepower and any noise related power losses would result in an unacceptable tradeoff between safety and noise reductions. The FAA does not believe that the fact that an aircraft is type certificated in the arcobatic category under Part 23 of the Federal Aviation Regulations justifies exclusion of the aircraft from noise rules. It should be noted, however, that this amendment does not apply to experimentally certificated aircraft used for acrobatics.

One comment stated that the type certification noise standards, while essential, must be supplemented with operational procedures in order to ensure adequate noise control. This comment stated that all airplane flight manuals should contain a chapter on noise causes and abatement procedures to make pilots sensitive to noise problems. The FAA agrees that operating procedures are an important aspect of the overall solution to the aircraft noise problem. It is also agreed that airplane flight manuals (in addition to containing noise information obtained during type certification) may be a useful means of conveying an awareness of aircraft noise problems to the owners and operators of aircraft. While the FAA encourages manufacturers to develop general information in this area the FAA, because of the close relationship between noise operating procedures and safety, does not believe that specific procedures should be recommended and approved in an airplane flight manual.

One comment cited two reports ("Transportation Noise and Noise from Equipment Powered by Internal Combustion Engines," NTID 300.13, U.S. Environmental Protection Agency, December 31, 1971, and Results of Noise Survey of Seventeen General Aviation Aircraft, FAA, December, 1972) and performance data on the aircraft of two manufacturers as indicating that, for new production aircraft of current types, the proposed standard to be applied to airworthiness certification should be made effective for all types prior to January 1, 1980. While the FAA does not disagree with the general accuracy of much of the information cited by the commentator, that information does not address the potentially serious impacts on certain aircraft types, that could result if the January 1, 1980, date were accelerated.

One comment stated that the public is concerned with the noise generated by an aircraft and, from this standpoint, is not concerned with the weight of the aircraft generating the noise. This being the case, the comment asks why aircraft smaller than 12,500 pounds should be subject to noise limits lower than those that apply at the higher weight. The FAA agrees that the annoyance caused by aircraft noise is not related directly to the weight of an aircraft. However, weight is chosen as the basis for selecting the applicable noise limits because the weight of an aircraft is directly related to the engine power required by the aircraft, and, in general, the higher horsepower engines are capable of generating more noise than low horsepower engines. From the standpoint of technological practicability and economic reasonableness, it is appropriate that weight differences be reflected in the limiting noise levels.

One comment pointed out differences between the proposed FAA standards and procedures being considered for adoption by the International Standardization Organization (ISO). These comments concerned the measurement unit, the test conditions, and the number of required overflights. First, the comment recommends the addition of a duration conversion to dB(A). The addition of a duration correction adds complexity to the certification process similar to that required for other units rejected for that reason. There has been no demonstrated requirement for a measurement unit more complex than the universally accepted A-weighted decibel. The comment also noted differences between the "test window" (i.e. the limiting atmospheric conditions) proposed for ISO adoption and that proposed for adoption by the FAA. The ISO proposal is more restrictive than the FAA proposal in that it allows less variation in the atmospheric absorption coefficients. The FAA does not believe that this more restrictive test is necessary in order to obtain valid acoustical data for propeller driven small airplanes. The "test window" proposed in the Notice is believed to be adequate. The commentator stated that the ISO proposal would permit a ±100 foot variation in test altitude but would require correction to the required 1,000-foot altitude, whereas the Notice proposed only a ±30-foot variation and did not propose any correction procedure. The FAA believes that the smaller altitude variation can be practically complied with during the test flights and believes that correction procedures, within the permitted altitude variation, would merely add unnecessary complexity without significantly affecting the noise levels generated by the aircraft. This aspect of the proposal is, therefore, believed to be valid. Finally, the commentator suggested that six overflights, rather than four, would be appropriate considering the confidence limits proposed in the notice. This comment has merit. Six over-flights are specified herein.

One comment pointed out a conflict between proposed § F36.101(b) (which prohibits all testing at relative humidities higher than 90 percent), and § F36.201(a) which implies that tests may be conducted with relative humidities higher than 90 percent, if data corrections are made. It was not intended that the effect of § F36.101(b) be altered by the data correction procedures in § 36.201. To eliminate this inconsistency, the words "above 90 percent or" are not included in § F36.201(a).

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One comment stated that rather requiring maximum continuous power and permitting accelerated flight (for aircraft that can exceed a limiting airspeed at maximum continuous power), the regulation should require the test to be conducted at the airspeed limit but at reduced power. The FAA believes that reduced power may mask noise problems that may be evident at maximum continuous power. The use of accelerated flight does not significantly affect the accuracy of measured data. Therefore, this amendment specifies maximum continuous power and permits accelerated flight.

One comment stated that § F36.105(e) implies the use of the "slow" dynamic characteristics of the sound level meter and that this should be expressly stated. The FAA agrees. This provision, therefore, includes the words "with dynamic characteristics designated 'slow' " after the words "A filter."

One comment questioned the need for, and the added regulatory complexity caused by, permitting aircraft of 3,300 pounds and above to generate 2 more dB(A) now than in the future. The FAA believes that the overall noise levels and timing provisions in this amendment properly reflect economic and technological factors involved in the certification of propeller driven small airplanes.

One comment noted the possibility of an abrupt change in severity as between the provisions of Appendix F for aircraft close to 12,500 pounds, and the provisions of Appendix C for turbojets and for transport category airplanes slightly heavier than 12,500 pounds. The FAA agrees that Appendix F does represent a significant advance in noise reduction over Appendix C for aircraft close to the 12,500 pound dividing line. However, this reflects the fact that Appendix C was primarily developed to respond to the technological problems associated with the abatement of turbojet noise, whereas the provisions of Appendix F deal exclusively with the inherently lower noise levels of propeller driven small airplanes.

One comment opposed the proposal that aircraft used for dispensing fire fighting or agricultural materials be required to comply with FAA approved noise abatement routes and flight plans if they cannot meet the prescribed noise limits. This comment indicated that neither agricultural nor fire fighting operations can be continued under such a restraint since both kinds of operation may require a capability of rapid response that is incompatible with a job-by-job approval of routes for noise abatement purposes. The FAA agrees with this comment and does not adopt this proposal.

One comment raised the question of whether the recording of flyover noise should be made with "A" or "linear" weighting. There is no need to specify which weighting is required since the "A" weighting required to obtain dB(A) noise value may be applied during the recording or during the analysis of the tape. The comment also asked whether a specified calibration procedure is intended. There does not appear to be a need to restrict the applicant to a particular calibration procedure, in view of the rapidly changing technology in this field. The FAA, therefore, will consider, for approval, any calibration procedure that yields accurate and reproducible results.

One comment asked whether a nondirectional microphone could be used. This amendment does not prohibit the use of such microphones.

One comment stated that the noise tests cannot be conducted at maximum weight because of the burnoff of fuel needed to conduct the tests. The FAA agrees. This amendment provides that, if the test is conducted at weights less than an airworthiness limited weight, the lower weight becomes an operating limitation. However, to reflect this comment, this amendment adds an exception where needed to account for fuel that must be used during the test itself.

One comment recommended that testing be prohibited at altitudes greater than 6,000 feet above sea level. The FAA believes that this comment may have merit for airplanes powered by supercharged engines and will monitor the administration of this amendment to those airplanes to determine if additional rulemaking is needed. For normally aspirated engines, the decrease of available power with altitude normally would, in any case, prevent the developing of maximum continuous power at high altitudes. This amendment does not contain an altitude limit as a test requirement.

One comment stated that proposed § F36.109(g) implies that a time history record of position must be kept. Beyond requiring the applicant to demonstrate that the position of the airplane, during the actual measurement of noise, complies with the regulation, this amendment does not require the keeping of a time history of position.

One comment stated that the methods used to correct for temperature and humidity data outside of the specified limits should either be specified in the regulations or should be methods complying with acceptable industry practices. The FAA does not believe that a particular correction method should be prescribed and will consider any method that adequately corrects the data to the acoustical standard day.

One comment stated that the formula in § F36.201(c) should be limited to sea level standard day conditions for a normal takeoff distance. The values used in the formula (except for takeoff distance in some cases) are those developed during type certification under the airworthiness regulations. It is, therefore, not believed to be necessary to specify the conditions under which they are developed. Where takeoff distance is not developed as approved performance information, the values in § F36.201(d) must be applied in each case, so that reference to sea level is not needed.

One comment requested that the definition of "acoustical change" in § 21.93(b) be amended to specify that an acoustical change is one that may increase the noise levels of the airplane "in terms of FAR 36 measurement criteria." Since that paragraph begins with the words "for the purpose of complying with Part 36 of this chapter . . ." and in view of several years of administering § 21.93(b) without problems concerning the definition of "acoustical change," the FAA does not believe that the suggested language is necessary.

One comment stated that the proposed amendment to § 21.115(a) (which proposed to add a reference to the acoustical change requirements to that paragraph) is unnecessary since § 21.115(b) already requires compliance with § 21.33(b) which includes required noise standards. The FAA agrees in part. However, to ensure that the section heading and paragraph (a) of § 21.115 are consistent with the other regulatory changes in this amendment, the change to that section is adopted as proposed.

One comment stated that, while noise standards are appropriate conditions of type certification, they should not be applied to the issuance of airworthiness certificates. The question of application of noise standards to type and airworthiness certificates was addressed in Notice No. 72-19. Newly Produced Airplanes of Older Type Designs, published in the Federal Register (37 F.R. 14813) on July 25, 1972. In that Notice, (which first associated noise standards with airworthiness certificates) it was stated that the proposed application of noise standards to airworthiness certificates—

> ". . . reflects the requirement in § 611(a) of the Federal Aviation Act of 1958 that the Administrator shall issue noise abatement regulations 'including the application of such standards, rules, and regulations in the issuance . . . of any certificate authorized by this title.' Whereas the appropriate certificate for insuring that new type designs incorporate acoustical performance features is the type certificate, and Part 36 therefore currently governs the issuance of type certificates . . . only, the airworthiness certificate is an appropriate title VI certificate for insuring that new production copies of previously type certificated aircraft incorporate acoustical performance design features prior to operation. This is the case because the airworthiness certificate is individually issued to each aircraft after production, and is therefore useful as a means of distinguishing (e.g. by date of issuance) those particular aircraft within a production run that require noise compliance demonstration . . ."

For the reasons discussed in Notice 72-19, the FAA believes that it is appropriate to apply noise standards to the issuance of airworthiness certificates to previously type-certificated aircraft where the objective is imposing noise standards on newly produced aircraft of older type designs.

One comment stated that the proposed regulation is not adequate since—(1) it does not account for the noise of aircraft operating below 1,000 feet, as during landing and takeoff, and (2) it does not involve retrofit of the current fleet of propeller driven small airplanes. By requiring maximum continuous power at the 1,000-foot altitude, the FAA believes that this amendment also addresses the noise source that is also a problem at lower altitudes, and that the added complexity of takeoff and approach noise measurements would not be justified at this time. With respect to retrofit of the current fleet, the FAA is considering the advisability of such a regulation, but does not believe that adoption of this amendment should be delayed pending the results of this review.

One comment, in addition to recommending omission of the performance correction and increasing the severity of the regulation also recommended that low speed multibladed propellers and chamber-type mufflers be required. The FAA believes that, rather than require specific type design details, this first issuance of a noise rule for propeller driven small airplanes should set quantitative noise limits and permit any means of compliance that also complies with the applicable airworthiness requirements.

One comment stated that there should be provision in the regulation itself for progressively reducing the maximum permitted noise level as new and more advanced technology is developed. The FAA agrees that the regulation should be reviewed and amended when justified by new technology. However, this should be accomplished, in each case, with notice and public procedure as required by the Administrative Procedure Act. Provision for the future lowering of noise limits is not, therefore, included in this amendment.

Consistent with the fact that certain propeller driven small airplanes are not required to have an Airplane Flight Manual, but may have any combination of manuals, markings, or placards, this amendment revises the statement required by § 36.1581 to refer to "noise levels of this airplane" rather than "noise levels in this manual."

Finally, editorial changes are made to improve the presentation of regulatory material. These include moving all of the acoustical change provisions of Part 36 to a new § 36.7, and the restructuring of the applicability provisions of § 36.1.

Authority: Section 313(a), 601, 603, and 611 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, and 1431); section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)); Title I of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.); and Executive Order 11514, March 5, 1970.

In consideration of the foregoing, Parts 21 and 36 of the Federal Aviation Regulations are amended, effective February 7, 1975.

Amendment 21–43

Form Number and Clarifying Revisions

Adopted: December 31, 1974 Effective: February 14, 1975

(Published in 40 F.R. 2576, January 14, 1975)

The purpose of these amendments is to incorporate into Parts 21, 23, and 25 of the Federal Aviation Regulations several form number and clarifying revisions.

These amendments are based on a Notice of Proposed Rule Making (Notice No. 74–33) published in the Federal Register on October 11, 1974 (39 F.R. 36495) and are the first amendments issued as a part of the First Biennial Airworthiness Review Program (ref. Notice No. 74–5, 39 F.R. 5785). These amendments and the reasons therefor are the same as those proposed in Notice No. 74–33.

Interested persons have been afforded an opportunity to participate in the making of these amendments. No objections were received.

These amendments are made under the authority of sections 313(a), 601, 603, and 608 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, and 1428), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

In consideration of the foregoing, and for the reasons stated in Notice No. 74–33, Parts 21, 23, and 25 of the Federal Aviation Regulations are amended effective February 14, 1975.

Amendment 21-44

Airworthiness Review Program

Amendment No. 3: Miscellaneous Amendments

Adopted: December 13, 1976 **Effective: February 1, 1977**

(Published in 41 FR 55454, December 20, 1976)

The purpose of these amendments is to update and improve—(1) the aircraft, engine, and propeller certification regulations; (2) the operating regulations containing airworthiness standards; and (3) related procedural requirements.

These amendments are based on a notice of proposed rule making (Notice 75-10) published in the Federal Register on March 7, 1975 (40 FR 10802) and are the third in a series of amendments to be issued as part of the First Biennial Airworthiness Review Program. The following series of amendments have previously been issued as part of this Airworthiness Review Program:

Title	*Federal Register citation*
Form number and clarifying revisions	(40 F.R. 2576; Jan. 14, 1975)
Rotorcraft anticollision light standards	(41 F.R. 5290; Feb. 5, 1976)

Interested persons have been afforded an opportunity to participate in the making of these amendments and due consideration has been given to all matter presented. A number of substantive changes and changes of an editorial and clarifying nature have been made to the proposed rules based upon the relevant comments received and upon further review within the FAA. Except for the minor editorial and clarifying changes and the substantive changes discussed hereinafter, these amendments and the reasons therefore are the same as those contained in Notice 75-10.

After issuing Notice 75-10, the following six additional notices of proposed rule making were issued as part of the First Biennial Airworthiness Review Program.

Notice No.	*Federal Register citation*	*Title*
75-19	40 F.R. 21866; May 19, 1975.	Notice No. 3: Powerplant Proposals.
75-20	40 F.R. 22110; May 20, 1975.	Notice No. 4: Equipment Deviation List.
75-23	40 F.R. 23048; May 27, 1975.	Notice No. 5: Equipment and Systems Proposals.
75-25	40 F.R. 24664; June 9, 1975.	Notice No. 6: Flight Proposals.
75-26	40 F.R. 24802; June 10, 1975.	Notice No. 7: Airframe Proposals.
75-31	40 F.R. 29410; July 11, 1975	Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals.

Based upon further review by the FAA, a number of proposals which were contained in Notice 75-10 are not being dealt with herein but will be considered in conjunction with other proposals contained in one of the later Airworthiness Review Program Notices of proposed rule making.

The following discussion is keyed to the like-numbered proposals contained in Notice 75-10:

Proposal 2-1. One commentator suggested that the proposed change to § 21.33(a) be revised to limit the new aircraft engine and propeller inspection and test provisions to prototypes only. The FAA does not agree. The intent of the proposals was to make the inspection and test requirements in § 21.33(a) compatible for aircraft, aircraft engines, and propellers. The provision applies to the item presented for type certification tests irrespective of whether or not the item is considered a prototype by the applicant for the type certificate. The proposal is therefore, adopted without substantive change.

Proposal 2-2. No unfavorable comments were received on the proposal to amend § 23.23. Accordingly, the proposal is adopted without substantive change.

Proposal 2-3. No unfavorable comments were received on the proposal to amend § 23.141. Accordingly, the proposal is adopted without substantive change.

Proposal 2-4. No unfavorable comments were received on the proposal to amend § 23.143(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2-5. No unfavorable comments were received on the proposal to amend § 23.145. Accordingly, the proposal is adopted without substantive change.

Proposal 2-6. The proposed change to § 23.149(b) concerning the language "without exceptional piloting skill, alertness, or strength" is related to a proposed amendment to § 23.149 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to § 23.149(b) contained in Notice No. 2 is therefore being deferred until final rule making action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-6 will be considered at that time.

Proposal 2-7. Although no unfavorable comment was received on the proposal to amend § 23.175(c), the FAA believes that clarification is necessary. The term "or thrust" has been added to the end of the language "maximum cruising power" in proposed § 23.175(c)(3). Proposed § 23.175(c)(4) was intended to clarify the requirement concerning trim speed, but the FAA believes the conflict in language with a similar provision in § 23.175(b)(2)(iii) may cause confusion. Therefore, proposed § 23.175(c)(4) is withdrawn.

Proposal 2-8. The proposed change to § 23.253(b) is related to a proposed amendment to § 23.253(b)(3) that is contained in Airworthiness Review Program, Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75-31; 40 FR 29410 July 11, 1975). The proposed amendment to § 23.253(b) contained in Notice No. 2 is therefore being deferred until final rule making action is taken with respect to the related proposal in Notice 75-31. Comments submitted for Proposal 2-8 will be considered at that time.

Proposal 2-9. No unfavorable comments were received on the proposal to amend § 23.397. Accordingly, the proposal is adopted without substantive change.

Proposal 2-10. No unfavorable comments were received on the proposal to add a new § 23.479(d). Accordingly, the proposal is adopted without substantive change.

Proposal 2-11. One commentator objected to the proposed use of the language "materials used for parts, the failure of which could adversely affect safety" in place of the language "materials used in the structure" in §§ 23.603(a) and 25.603. The FAA does not agree with the commentator's suggestion that all parts of the airplane should, unless specifically excluded, be considered structure. The FAA believes that consideration of the suitability and durability of materials used should be broadened to include parts not normally considered airplane structure.

Proposal 2-12. No unfavorable comments were received on the proposal to amend § 23.607. Accordingly, the proposal is adopted without substantive change.

Proposal 2-13. A commentator questioned whether proposed § 23.675 would require that stops provided to limit the range of motion of an aerodynamic surface be located only on the aerodynamic surface or whether the stop could be located adjacent to the surface. Section 23.675, as proposed and as adopted herein, without change, requires that stops positively limit the range of motion of moveable aerodynamic surfaces. This can be accomplished by locating the stop on structure adjacent to the surface.

Proposal 2-14. No unfavorable comments were received on the proposal to amend § 23.685(a). Accordingly, the proposal is adopted without substantive change. See proposal 2-109.

Proposal 2-15. No unfavorable comments were received on the proposal to add a new § 23.733(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-16. No unfavorable comments were received on the proposed new § 23.737(f). However, one commentator pointed out that the word "contract" in the proposal as printed in the Federal Register should be "contact." The proposal has been corrected to eliminate the printing error. The proposal has also been clarified based on a comment received on Proposal 2-111, to avoid any implication that lamps will be required in cargo compartments.

Proposal 2-17. On commentator questioned the need in proposed § 23.841(b)(6) for a warning indicator at the pilot station to indicate when a cabin pressure altitude of 10,000 feet is exceeded. But as noted by the commentator it is a general industry practice to provide this warning at a cabin altitude of 10,000 feet. The FAA believes that due to the larger number of small airplanes having such awarning many pilots may come to rely on the warning at this cabin altitude. The proposal is therefore adopted without substantive change.

Proposal 2-18. The proposed changes to §§ 23.853, 27.853, and 29.853 concerning the certification requirements necessary to permit smoking in certain aircraft categories are related to proposed standards for § 25.853. The amendments proposed for § 25.853 are contained in Airworthiness Review Program Notice No. 2: Miscellaneous Proposals (Notice 75-10; 40 FR 10802; March 7, 1975) and in Airworthiness Review Program Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75-31; 40 FR 29410; July 11, 1975). The proposals for § 25.853 in Notice 75-10 is being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-31. The proposed amendments to §§ 23.853, 27.853 and 29.853 contained in Notice 75-10 are therefore being deferred until final rulemaking action is taken with respect to the related proposal for § 25.853. Comments submitted for Proposals 2-18, 2-114, and 2-160 will be considered at that time.

Proposal 2-19. One commentator suggested a clarification of proposed new § 23.903(b) noting that the language, 'must be designed to give reasonable assurance" would be subject to divergent application. The same language is now used in § 25.903(d)(2), and the FAA believes that experience with this provision in transport category type certification has been satisfactory.

One commentator suggested that a provision similar to § 25.903(d)(1) concerning design precautions to minimize hazards to the airplane in the event of an engine rotor failure be included in proposed §§ 23.903(b), 27.903(c), and 29.903(f). Although several airworthiness directives have been issued to prevent the failure of engine rotors in one engine type, the FAA does not believe that a general requirement for §§ 23.903(b), 27.903(c), or 29.903(f) that is identical to § 25.903(d)(1) is necessary at this time.

Proposal 2-20. No unfavorable comments were received on the proposal to amend § 23.933(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2-21. One commentator objected to proposed new § 23.941 concerning airplanes with variable inlet or exhaust system geometry as being unnecessary and unjustified in Part 23. The FAA agrees that this provision should not be added to Part 23 at this time and is therefore withdrawing the proposal.

Proposal 2-22. One commentator suggested that the proposed changes to §§ 23.971 and 23.999 be revised to require a quick actuation drain valve on each fuel tank. The proposal, however, was not to require new drainage outlets but to establish standards for the drains set forth in proposed § 23.971(b) and present § 23.999(a). The FAA does not have sufficient information to indicate that a need exists for a quick actuation drain valve on each fuel tank considering the large number of different types of fuel tanks which are included on Part 23 airplanes and the use of sediment bowls and chambers. The proposal is therefore adopted without substantive change.

Proposal 2-23. One commentator question the proposed requirement in § 23.977 (a)(2) that a turbine engine fuel strainer prevent the passage of any object that could restrict fuel flow or damage any fuel system component. The commentator asserted that a strainer which met this requirement would have an opening so small that ice accumulation with the use of turbine fuels would be a problem. The FAA does not agree. This is identical to the provision in § 25.977(a)(2). Experience with fuel strainers that would meet the proposed standards in § 23.977(a)(2) has shown that a strainer can prevent the passage of the noted objects and also prevent ice accumulation.

One commentator noted that the clear area of each fuel tank outlet strainer should be at least six times the area of the outlet line instead of five times as proposed in § 23.977(b). This provision is identical to § 25.977(c) and the FAA considers that experience with this requirement in Part 25 has been satisfactory.

Proposal 2–24. The intent of the proposal to add a new § 23.979(e) was to provide strength requirements including load factors, applicable to the airplane defueling system to cover surge pressure during defueling. Upon further review the FAA believes that the proposed amendment is premature. Therefore, the proposal is withdrawn.

Proposal 2–25. No unfavorable comments were received on the proposal to amend § 23.995(d). Accordingly, the proposal is adopted without substantive change.

Proposal 2–26. One commentator suggested that there should be sufficient clearance between the quick actuation drain and other parts of the airplane to allow the fuel sample to be drained into a typical, small container. The FAA believes fuel system drains which meet the proposed requirements of paragraphs(b)(1) and (b)(3) of § 23.999, that the drain discharge clear of all parts of the airplane and that it be readily accessible, will have sufficient clearance to allow a fuel sample to be drained into a small container.

One commentator suggested that the requirement in § 23.999(b)(1)) that the drain must discharge clear of all parts of the airplane, would create unnecessary design and construction restraints. The FAA believes that by coating some airplane surfaces with fuel or by trapping quantities of fuel in certain locations a fire hazard exists. This fire hazard should be limited by this proposal. Further, the FAA believes this requirement can be met without an undue restraint on airplane design.

A commentator asserted that the proposed requirement in § 23.999(b)(3), that the drain valve be either located or protected so that it will not be damaged in the event of a landing with landing gear retracted cannot be justified. The commentator noted that the fuel tanks would be ruptured in such a landing and nothing would be gained if the drain was protected. The FAA disagrees, similar fuel tank installation requirements are set forth in § 23.967 and experience indicates that the fuel system can and should be either located or protected to prevent fuel leakage in such a landing. The FAA does agree that the proposal needs to be clarified to more specifically provide a design specification and has, so modified paragraph (b)(3). Also see Proposal 2–70.

Proposal 2–27. No unfavorable comments were received on the proposal to add a new § 23.1093(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–28. Proposed § 23.1111(c) was misunderstood by one commentator who asserted that it is not possible to assure the impossibility of failure of the engine lubricating system. The proposal, however, was directed toward the elimination of hazardous contamination of the cabin air assuming a failure of the engine lubricating system. In consideration of the misunderstanding, the language has been revised to emphasize the prevention of hazardous contamination of cabin air system.

Proposal 2–29. Although no unfavorable comment was received on the proposed § 23.1125, the FAA believes that the proposal could misunderstood as to whether use of the heat exchanger would permit or prohibit the passage of exhaust gases through the exchanger when hot air was not being directed to the area where it was intended to be used. The FAA's intention was to require cooling of the exchanger wherever it was in contact with exhaust gases, regardless of its usage status. The proposal is revised to make this clear using the language of §§ 25.1125(a)(3) and 29.1125(a)(3). The FAA believes that the exhaust heat exchange requirements should be paralleled in Parts 23, 25 and 29. Therefore the proposed changes to §§ 25.1125(a)(3) and 29.1125(a)(3) are withdrawn.

Proposal 2–30. No unfavorable comments were received on the proposal to amend § 23.1143. Accordingly, the proposal is adopted without substantive change.

Proposal 2–31. One commentator believed that proposed § 23.1165(e) was unnecessarily restrictive in requiring all ignition systems to be independent of all other electrical systems. The FAA agrees with respect to reciprocating engines since § 33.37 requires a

dual ignition system or an ignition system of equivalent inflight reliability for reciprocating engines and § 23.903 requires each engine installed on small airplanes to be type certificated under Part 33. However, the FAA disagrees with respect to turbine engines since two separate primary electrical circuits are not required in § 33.69. The rule as adopted is applicable to turbine engines installed on small airplanes only.

Proposal 2–32. One commentator objected to the proposal to add a speed warning device for turbopropeller powered airplanes. The FAA believes that due to the characteristics of turbopropeller powered airplanes that make it desirable to operate at the maximum operating limit speed (V_{MO}/M_{MO}), and the increasing preoccupation of pilots with air traffic and other duties which distract them from continuous monitoring of airspeed instruments overspeed conditions can be a problem. Therefore, to insure early warning and thus to make a major portion of the speed margin available for pilot reaction and recovery maneuvers, the amendment requires that the speed warning device must give effective aural warning (differing distinctively from aural warnings used for other purposes) to the pilots whenever the speed exceeds V_{MO} plus 6 knots or $M_{MO}+0.01$.

It should also be noted that the proposal for § 23.1303(d) has been revised to make it like § 25.1303(a)(1) to allow for an air temperature indicator which provides indications that are convertible to free-air temperature.

Proposal 2–33. No unfavorable comments were received on the proposal to amend § 23.1309. Accordingly, the proposal is adopted without substantive change.

Proposal 2–34. One commentator suggested that proposed §§ 23.1322 and 25.1322 concerning warning, caution, and advisory light be revised. The commentator noted that requiring a blue light for position indication was not always appropriate since blue was difficult to see in direct sunlight but was readily distinguishable in heavily shaded installations. The FAA agrees that blue should not be an established standard applicable to all installations. Therefore proposed §§ 23.1322(d), 25.1322(d), 27.1322(d) and 29.1322(d), concerning blue lights, are withdrawn. Also see Proposal 2–82.

Proposal 2–35. The proposed amendments to §§ 23.1325, 25.1325, and 29.1325 concerning the static pressure sources are related to proposed amendments to § 27.1325 that are contained in Airworthiness Review Program, Notice No. 2: Miscellaneous Proposals (Notice 75–10; 40 FR 10812; March 7, 1975) and in Airworthiness Review Program, Notice No. 5: Equipment and System Proposals (Notice 75–23; 40 FR 23048; May 27, 1975). The proposed amendment to § 27.1325 in Notice 75–10 is being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–23. The proposed amendments to §§ 23.1325, 25.1325, and 29.1325 contained in Notice 75–10 are therefore being deferred until final rulemaking action is taken with respect to the related proposed amendments to § 27.1325. Comments submitted for Proposals 2–35, 2–83, and 2–183 will be considered at that time.

Proposal 2–36. One commentator questioned the proposed lead-in for § 23.1331(b). The commentator interpreted the proposal to mean that each instrument must have independent power sources and noted that the explanation did not indicate this to be intended. The FAA agrees that the proposal is not clear, and the proposal is withdrawn.

Proposal 2–37. The proposed change to § 23.1335 concerning the deletion of the section is related to a proposed amendment to § 23.1335 that is contained in Airworthiness Review Program, Notice No. 5: Equipment and Systems Proposals (Notice 75–23; 40 FR 23048; May 27, 1975). The proposed amendment to § 23.1335 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–23. Comments submitted for Proposal 2–37 will be considered at that time.

Proposal 2–38. No unfavorable comments were received on the proposal to amend § 23.1351. Accordingly, the proposal is adopted without substantive change.

Proposal 2–39. Proposed § 23.1353(f) concerning nickel-cadmium batteries is related to a proposed amendment to § 23.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 23.1353 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–25. Comments submitted for Proposal 2–39 will be considered at that time.

Proposal 2–40. For comments related to the proposed amendment of § 23.1385, see Proposal 2–89.

Proposal 2–41. One commentator suggested that proposed § 23.1411(b)(2) be revised to conform to the language in § 25.1411(b)(2). The FAA, however, believes a more specific standard is appropriate for §§ 23.1411 and 27.1411. Therefore, the proposed amendments to §§ 23.1411 and 27.1411 are adopted without substantive change.

Proposal 2–42. One commentator suggested that the proposed change to § 23.1549 be revised to accommodate horizontal scale powerplant instruments. The FAA agrees, and §§ 23.1549, 27.1549 and 29.1549, as adopted, will provide marking standards appropriate to circular, horizontal and vertical scale powerplant instruments.

Proposal 2–43. The proposed change to § 23.1555 concerning the information requirements of usable fuel in a restricted use fuel tank is related to a proposed amendment to § 23.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 23.1555 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–25. Comments submitted for Proposal 2–43 will be considered at that time.

Proposal 2–44. The proposed change to § 23.1557 concerning the system voltage marking requirement adjacent to its external power connection is related to a proposed amendment to § 23.1557 that is contained in Airworthiness Review Program, Notice No. 3; Powerplant Proposals (Notice 75–19; 40 FR 21866; May 19, 1975). The proposed amendment to § 23.1557 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–19. Comments submitted for Proposal 2–44 will be considered at that time.

Proposal 2–45. The proposed change to § 23.1581 concerning the Airplane Flight Manual is related to a proposed amendment to § 23.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 23.1581 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related Proposal in Notice 75–25. Comments submitted for Proposal 2–45 will be considered at that time.

Proposal 2–46. The proposed change to § 23.1587(a)(2) is related to proposed amendments to § 23.1587 that were contained in Airworthiness Review Program, Notice 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 23.1587 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–25. Comments submitted for Proposal 2–46 will be considered at that time.

Proposal 2–47. One commentator suggested that considering the proposed deletion of §§ 25.45 through 25.75, current § 25.161(e) will need to be amended to replace the reference to § 25.69. The FAA agrees, and § 25.161(e)(1) is amended by striking the reference to § 25.69 and inserting in place thereof a reference to § 25.123(a). In addition, the FAA has found that § 25.201(c)(1) refers to § 25.49(c)(2)(i) that would also be deleted. Therefore, § 25.201(c)(1) as amended strikes the phrase "§ 25.49(c)(2)(i) for reciprocating engine powered airplanes, or in" and the phrase "for turbine engine powered airplanes".

Proposal 2–48. No unfavorable comments were received on the proposed change to strike the words "turbine powered" from § 25.101(a). Accordingly, proposed § 25.101(a) is adopted without substantive change.

No unfavorable comments were received on proposed § 25.101(b) and it is adopted as proposed except that it is clarified to indicate that the 80% relative humidity for reciprocating engines is based on standard atmospheric temperature (the vapor pressure values in the table in proposed § 25.101(b)(2) correspond to 80% relative humidity with a standard atmosphere).

Proposal 2–49. Based on comments reveived on the proposal to amend § 25.105 and on the related proposals to §§ 25.125, 25.241 and 25.1533(c), and upon further review by the FAA, Proposals 2–49, 2–51, 2–52 and the portion of 2–93 dealing with the new operating limitation requirements for transport category airplanes intended to be used in operations on unpaved runways are withdrawn.

Proposal 2-50. No unfavorable comments were received on the proposal to amend § 25.107. Accordingly, the proposal is adopted without substantive change.

Proposal 2-51. For comments related to the withdrawal of the proposed amendment of § 25.125, see Proposal 2-49.

Proposal 2-52. For comments related to the withdrawal of the proposal to add a new § 25.241, see Proposal 2-49.

Proposal 2-53. No unfavorable comments were received on the proposal to amend § 25.397. Accordingly, the proposal is adopted without substantive change.

Proposal 2-54. For comments related to the proposed amendment of the lead-in of § 25.603, see Proposal 2-11.

Proposal 2-55. No unfavorable comments were received on the proposal to amend § 25.675. Accordingly, the proposal is adopted without substantive change. Also see Proposal 2-13.

Proposal 2-56. No unfavorable comments were received on the proposal to amend § 25.685(a). Accordingly, the proposal is adopted without substantive change. See Proposal 2-109.

Proposal 2-57. No unfavorable comments were received on the proposal to add a new § 25.733(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-58. One commentator questioned whether the proposed § 25.775(e) would require that there be at least two windshield panels in the windshield for each pilot. The intent of the proposal, however, is to provide at least one windshield panel through which at least one pilot could see if vision was lost through another panel.

Proposal 2-59. Proposed § 25.783(g) concerning integral stairs installed in passenger entry doors that qualify as passenger exits is related to a proposed amendment to § 25.783 that is contained in Airworthiness Review Program, Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75-31; 40 FR 29410; July 11, 1975). The proposed amendment to § 25.783(g) contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-31. Comments submitted for Proposal 2-59 will be considered at that time.

Proposal 2-60. The proposed change to § 25.785 is related to a proposed amendment to § 25.785 that is contained in Airworthiness Review Program, Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75-31; 40 FR 29410; July 11, 1975). The proposed amendment to § 25.785 contained in Notice No. 2 is, therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-31. Comments submitted for Proposal 2-60 will be considered at that time.

Proposal 2-61. No unfavorable comments were received on the proposed new § 25.787(c). However, based on a comment received on Proposal 2-111, this proposal has been revised to avoid any implication that lamps will be required in cargo compartments.

Proposal 2-62. Four of the five comments received were in favor of the proposal for § 25.815 that would provide for the approval of an aisle width of less than 12 inches, but not less than 9 inches, in transport airplanes with a passenger seating capacity of 10 or less if the aisle width is substantiated by necessary tests. One commentator requested that the proposal be withdrawn because it would result in a reduction in the margin of passenger safety. The FAA disagrees. Service experience with aircraft certificated with less than a 12 inch aisle width in the past has been satisfactory.

Moreover, the FAA will not certificate transport category aircraft with less than a 12 inch aisle width unless the Administrator finds by necessary test that the narrower aisle is safe.

The proposal is adopted without change.

Proposal 2-63. The proposed change to § 25.831 concerning the temperature and ventilation controls for the crew compartment is related to a proposed amendment to § 25.831 that is contained in Airworthiness Review Program Notice No. 5: Equipment and Systems Proposals (Notice 75-23; 40 FR 23048, May 27, 1975). The proposed amendment to § 25.831 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-23. Comments submitted for Proposal 2-63 will be considered at that time.

Proposal 2-64. One commentator recommended that proposed § 25.841(b)(1) be revised to make it clear that the pressure relief function may be combined with the regulating valve. The proposal would delete the requirement that one of the pressure relief valves be a pressure regulating valve, but it would still allow such a design. This was specifically covered in Notice 75-10.

One commentator suggested that the language "passenger or crew compartment" in proposed § 25.841(b)(8) be changed to read "occupiable area in the cabin" to ensure that a pressure sensor is located in the lower deck service compartment. The FAA believes the language "occupiable area in the cabin" does not clarify the proposed requirements. The language "passenger and crew compartment" is not limited to the main deck of the airplane, but includes a lower deck service compartment even though this lower deck service compartment may not be occupied during takeoff and landing. For clarification, the parenthetical "(including upper and lower lobe galleys)" has been added to § 25.841(b)(8) as adopted.

Proposal 2-65. The proposed change to § 25.853 concerning the certification requirements necessary to permit smoking in transport category airplanes is related to a proposed amendment to § 25.853 that is contained in Airworthiness Review Program, Notice No. 8: Aircraft, Engine and Propeller Airworthiness, and Procedural Proposals (Notice 75-31, 40 FR 29410; July 11, 1975). The proposed amendment to § 25.853 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-31. Comments submitted for Proposal 2-65 will be considered at that time.

Proposal 2-66. No unfavorable comments were received on the proposal to amend § 25.933(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2-67. A commentator suggested that a cross-reference to § 25.143 should be added to proposed § 25.941. The FAA agrees that the pilot strength limits now set forth in § 25.143 should be referenced in § 25.941 in order to define appropriately what constitutes "exceptional strength on the part of the pilot". Accordingly, a paragraph (c) has been added to proposed § 25.941 for that purpose.

Proposal 2-68. Two commentators agreed with the intent of the proposed § 25.951(a) concerning fuel system design and operation of the auxiliary power unit (APU) but requested that it be withdrawn to allow time to review other Part 25 provisions for applicability to APU installations. The FAA does not believe that a further review of Part 25 should in this case, delay completion of this rulemaking action. However, if the FAA determines that the language "auxiliary power unit" should be specifically set forth in other provisions to avoid misinterpretation, the FAA will take action to clarify these provisions.

One commentator stated that the fuel system for an APU operated on the ground would be unnecessarily subject to the same requirement as the engine fuel system. The FAA does not agree that this is necessary. If certain operating conditions are the same for both the engine fuel system and the APU fuel system, the FAA believes that the requirements during such periods should be the same. The proposal is therefore adopted without substantive change.

Proposal 2-69. One commentator suggested that the language "proof and ultimate factors" in the proposal for new paragraphs (d) and (e) of § 25.979 be revised to be consistent with § 25.301. The FAA agrees that the terminology should be consistent and the section as adopted is reworded to use the term ultimate load.

One commentator questioned whether the design criteria for the pressure fueling system was applicable to fuel tanks and fuel tank vents. The proposed amendment to § 25.979 was not intended to apply to fuel tanks and vents. The section as adopted has been revised to make this clear.

Proposal 2-70. Several commentators questioned the meaning of the term "quick actuation drain valve" in proposed § 25.999(b)(3). The FAA agrees that the term may be subject to misinterpretation and that the provision is complete without the words "quick actuation".

One commentator asserted that the proposed requirement in § 25.999(b)(3) that the drain valve not be damaged in the event of a landing with landing gear retracted was not a proper design specification since damage was beyond the control of the manufacturer. The FAA agrees that the language "so that it will not be damaged" is not proper for this requirement, but the FAA believes that the valve, the location of the valve, or both, can be designed to prevent fuel spillage, assuming that a landing is made with the landing gear retracted. The section as adopted has been revised to clarify this intent.

Proposal 2–71. One commentator suggested that proposed § 25.1027(d) be revised to limit the design consideration to sludge or other foreign matter entering the feathering system from the oil tank. The FAA disagrees. Design consideration and flexibility should not be limited to preventing entry of material into the feathering system. All sources of sludge and foreign matter must be considered since the purpose of the regulation is the safe operation of the propeller feathering system. The proposal, therefore is adopted without substantive change.

Proposal 2–72. One commentator suggested that the word "critical" be added before the language "ground, water, and flight operating conditions" in the proposal for § 25.1041, but no reason was given. As noted in the explanation to this proposal, § 25.1041 contains a general cooling requirement, while §§ 25.1043 and 25.1045 are more specific with respect to the type of operating conditions which must be considered during tests. Critical conditions are included in the test requirements of §§ 25.1043 and 25.1045. However, the FAA believes that cooling provisions must be adequate under all ground, water, and flight operating conditions.

Proposal 2–73. No unfavorable comments were received on the proposal to amend § 25.1091(c)(2). Accordingly, the proposal is adopted without substantive change.

Proposal 2–74. One commentator agreed with the proposal for § 25.1093 but suggested that the proposal be changed to agree with the format of the previous paragraphs. The FAA agrees, and the proposal as adopted has been structured the same as the previous paragraphs.

Proposal 2–75. One commentator objected to the proposed lead-in for § 25.1125 that limited the applicability of the section to reciprocating engines. The FAA does not believe that the requirements of this section are applicable to other than reciprocating engine powered airplanes. While some early turbine powered airplanes have had an ejector installation in the exhaust stream to pull cooling air through the nacelle, the FAA does not consider this to be an exhaust heat exchanger within the meaning of the language of § 25.1125. Therefore, the proposed lead-in for § 25.1125 is adopted without substantive change.

Proposed § 25.1125(a)(3) is withdrawn. For a discussion of the withdrawal, see Proposal 2–29.

Proposal 2–76. A commenator stated that the phrase 'automatically controlled with relation to the amount of power produced by the engine" in proposed § 25.1143(d) is not appropriate for all fluid injection systems. The FAA agrees that the phrase is not appropriate for certain turbine engine powered airplanes and that further revision of § 25.1143(d) should be considered. Proposed § 25.1143(d) has therefore been withdrawn for further study.

No unfavorable comment was received concerning proposed § 25.1143(e) and this paragraph has been adopted without substantive change.

Proposal 2–77. No unfavorable comments were received on the proposal to add a new § 25.1167. Accordingly, the proposal is adopted without substantive change.

Proposal 2–78. No unfavorable comments were received on the proposal to amend § 25.1197(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2–79. One commentator suggested that proposed § 25.1303(a)(2) be revised to clarify the method of clock indication which would be permitted under the regulation. The FAA agrees that the intent of the proposal was only to recognize the development of accurate digital clocks and that the minimum information presented should be the same. Proposed §§ 25.1303(a)(2) and 29.1303(d) as adopted are revised to make this clear.

Proposal 2-80. Several commentators suggested that the proposed change to § 25.1305 be revised to except anti-detonant injection (ADI) systems from the powerplant instrument proposal for fluid augmentation systems. The commentators expressed the opinion that the proposal for § 25.1143(d) concerning automatic controls for fluid injection systems (other than fuel) eliminated the need for a powerplant instrument for the ADI system. The FAA believes that the flight crew should be able to monitor the proper functioning of any fluid system that is used for thrust or power augmentation and the section as adopted is applicable to ADI systems. However, the section has been clarified to ensure application only to fluids systems that are used for thrust or power augmentation.

Proposal 2-81. No unfavorable comments were received on the proposal to amend § 25.1309. Accordingly, the proposal is adopted without substantive change.

Proposal 2-82. One commentator questioned the proposed color standardization of warning, caution, and advisory lights in new § 25.1322. The commentator stated "arbitrary standards for specific light colors cannot always be stated" because of the design objective to minimize red lights that require immediate crew action and of the need to consider past experience, test, crew acceptance, and the specific application. The FAA agrees that considerations other than the need for standardization of light colors may dominate in special circumstances, and the section as adopted provides for approval by the Administrator of light colors that are different than the standard. As stated by the commentator and in the section as adopted, a design objective is to have red warning lights only if a hazard is to be indicated which may require immediate corrective action.

One commentator noted that the language "warning light" is used in other sections of the regulations, such as § 25.812(e)(2), and a hazard which may require immediate corrective action will not be indicated. The FAA does not agree; the light noted in § 25.812(e)(2) should be red in future designs unless otherwise approved by he Administrator. The FAA believes that in other sections, if the language "warning light" is used, it is consistent with proposed new § 25.1322. However, if the language "warning light" is determined to be not generally applicable, later rulemaking action can be instituted.

One commentator suggested a clarification of the lead-in of the proposal to limit its applicability to lights installed in the cockpit as indicated in the explanation to the proposal. The FAA agrees, and the lead-ins of §§ 23.1322, 25.1322, 27.1322, and 29.1322 have been clarified.

Also see Proposal 2-34 for a discussion of the withdrawal of the blue light proposal.

Proposal 2-83. For comments related to the deferral of proposed § 25.1325(g), see Proposal 2-35.

Proposal 2-84. The proposed change to § 25.1329 concerning the redesignation of § 25.1329 as § 25.1311 and the addition of provisions for automatic flight control systems is related to a proposed amendment to § 25.1329 that is contained in Airworthiness Review Program, Notice No. 5: Equipment and Systems Proposals (Notice 75-23; 40 FR 23048, May 27, 1975). The proposed amendment to § 25.1329 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-23. Comments submitted for Proposal 2-84 will be considered at that time.

Proposal 2-85. Proposed § 25.1331(a)(2) concerning instruments using a power supply is related to proposed amendments to §§ 25.1331 and 25.1333 that are contained in Airworthiness Review Program, Notice No. 5: Equipment and Systems Proposals (Notice 75-23; 40 FR 23048; May 27, 1975). The proposed amendment to § 25.1331(a)(2) contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposals in Notice 75-23. Comments submitted for Proposal 2-85 will be considered at that time.

Proposal 2-86. Proposed § 25.1337(a) concerning auxiliary power unit instrument lines is related to a proposed amendment to § 25.1337(a) that is contained in Airworthiness Review Program, Notice No. 3: Powerplant Proposals (Notice 75-19; 40 FR 21866, May 19, 1975). The proposed amendment to § 25.1337(a) contained in Notice No. 2 is therefore deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-19. Comments submitted for Proposal 2-86 will be considered at that time.

Proposal 2-87. Proposed § 25.1353(c)(5) is related to a proposed amendment to § 25.1585 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to § 25.1353(c)(5) contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-87 will be considered at that time.

Proposal 2-88. No unfavorable comments were received on the proposal to amend § 25.1355(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-89. Several commentators suggested that the list of factors to consider for locating forward and rear position lights in proposed §§ 23.1385, 25.1385, 27.1385, and 29.1385 was incomplete.

Two commentators, also suggested that proposed §§ 23.1385(c) and 25.1385(c) be revised to permit a new position light to be installed on each wing tip. The FAA agrees that further study is necessary to develop factors of general applicability for position lights on all aircraft but that a rear position light as far aft as practical on each wing tip of an airplane is a reasonable alternative location. Accordingly, proposed §§ 23.1385(c) and 25.1385(c) have been revised. The proposals concerning the list of factors to be considered for locating forward and rear position lights in § 25.1385 and paralleled in proposed §§ 23.1385, 27.1385, and 29.1385 are withdrawn. However, the deletion of the passing light requirement from current § 25.1385(e) will be made.

Proposal 2-90. One commentator asserted that proposed new § 25.1403 was an operating requirement, not an airworthiness requirement and therefore was not appropriate for Part 25. Although a similar requirement currently exists in § 121.341(b), the FAA believes that such a requirement should be applicable to all newly certificated transport category airplanes.

Two commentators pointed out that the proposal differs from § 121.341(b) in that the proposal was not limited to the area of the wings that are critical from the standpoint of ice accumulation. The FAA agrees, and the section as adopted has been revised accordingly.

A comment was also received that expressed the belief that under the proposal, illumination or other means of ice detection would not be necessary if the wing was shown to have acceptable ice accumulation characteristics. The FAA does not agree. Unless an operating limitation prohibits operations at night in known or forecast icing conditions, the means set forth are required.

Proposal 2-91. Several commentators said that the proposed change to § 25.1439(b)(2)(ii) concerning standards for masks and eye coverings was premature in view of the current testing being conducted on this type of equipment by the FAA. The FAA agrees that this proposed amendment is premature, and new standards are being considered for a later rulemaking action. The proposed change to § 25.1439(b)(2)(ii) is therefore withdrawn.

No favorable comments were received on the proposal to amend paragraph (a) of § 25.1439. Accordingly, the proposal is adopted without substantive change.

Proposal 2-92. No unfavorable comments were received on the proposal to amend § 25.1515. Accordingly, the proposal is adopted without substantive change.

Proposal 2-93. No unfavorable comments were received on the proposal to amend the heading of § 25.1533 and on the proposal to amend § 25.1533(a). Accordingly, this amendment is adopted without substantive change. For comments related to the withdrawal of the proposed new § 25.1533(c), see Proposal 2-49.

Proposal 2-94. The proposed change to § 25.1549 concerning the marking requirements for powerplant instruments is related to a proposed amendment to § 25.1549 that is contained in Airworthiness Review Program, Notice No. 3: Powerplant Proposals (Notice 75-19; 40 FR 21866; May 19, 1975). The proposed amendment to § 25.1549 contained in Notice No. 2 is therefore deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-19. Comments submitted for Proposal 2—94 will be considered at that time.

Proposal 2-95. One commentator took exception to the proposed deletion of the requirement for marking fuel and oil tank capacities at the filler openings in § 25.1557(b). The FAA believes this method of providing the usable fuel tank capacity and the oil tank capacity is no longer necessary. The pilot has the fuel quantity gage and the Airplane Flight Manual, and the servicing personnel usually have no interest in the usable fuel tank capacity. The determination of oil level in oil tanks is usually accomplished with the dipstick. Accordingly, the proposal is adopted without substantive change.

Proposal 2-96. The proposed change to § 25.1581 concerning the Airplane Flight Manual is related to proposed amendment § 25.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to § 25.1581 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-96 will be considered at that time.

Proposal 2-97. No unfavorable comments were received on the proposal to amend § 25.1583. Accordingly, the proposal is adopted without substantive change.

Proposal 2-98. The proposed change to § 25.1587 concerning performance information is related to a proposed amendment to § 25.1587 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposal amendment to § 25.1587 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-98 will be considered at that time.

Proposal 2-99. Two commentators questioned the applicability of proposed § 27.25(c) concerning a total weight that was greater than the maximum weight established under § 27.25(a) and noted that a clarification of the applicable flight requirements was needed. The FAA agrees that proposed § 27.25(c) should be clarified. Proposed §§ 27.25(c) and 29.25(c) are intended to provide only a total weight standard for approving the rotorcraft structure for rotorcraft that will be operated under Part 133. Proposed §§ 27.25(c) and 29.25(c) as adopted have been revised to clarify this intent.

Proposal 2-100. Proposed § 27.65(a)(2)(i) concerning climb gradients for rotorcraft other than helicopters is related to a proposed new § 27.1587(b)(3) that is contained in Airworthiness Review Program, Notice No. 2: Miscellaneous Proposals (Notice 75-10; 40 FR 10802; March 7, 1975). The proposed amendment to § 27.1587 contained in Notice 75-10 is being deferred; see Proposal 2-140. Therefore, the proposed amendment to § 27.65 contained in Notice 75-10 is also deferred until final rulemaking action is taken with respect to the related proposal for § 27.1587. Comments submitted for Proposal 2-100 will be considered at that time.

Proposal 2-101. No unfavorable comments were received on the proposal to amend § 27.141. Accordingly, the proposal is adopted without substantive change.

Proposal 2-102. No unfavorable comments were received on the proposal to amend § 27.173(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2-103. No unfavorable comments were received on the proposal to amend § 27.175(d)(2)(iv). Accordingly, the proposal is adopted without substantive change.

Proposal 2-104. No unfavorable comments were received on the proposal to amend § 27.321(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2-105. No unfavorable comments were received on the proposal to amend § 27.339. Accordingly, the proposal is adopted without substantive change.

Proposal 2-106. Two commentators suggested that the limit pilot torque for rotorcraft twist controls in proposed §§ 27.397(b)(2) and 29.397(b)(2) should be 80 times the radius (R) in inches instead of 133 inch-pounds, as proposed. The FAA agrees that the pilot torque load requirements should be a function of the radius (R). Also the FAA does not expect the radius (R) of any twist control installed on any rotorcraft type certificated in the future to be greater than 133/80 inches. Therefore, the proposals as adopted revise the limit pilot torque load to 80R inch-pounds.

Proposal 2-107. No unfavorable comments were received on the proposal to add a new § 27.563. Accordingly, the proposal is adopted without substantive change.

Proposal 2-108. No unfavorable comments were received on the proposal to amend § 27.603. Accordingly, the proposal is adopted without substantive change.

Proposal 2-109. One commentator disagreed with proposed §§ 27.685(a) and 29.685(a) that would require the consideration of the effects of the freezing of moisture on control systems since §§ 27.685(a) and 29.685(a) currently require that control systems be designed to prevent jamming. While the explanation for this proposal indicated that the freezing of moisture was a common cause of control jamming, the proposal is also directed at preventing chafing and interference caused by the freezing of moisture. Accordingly, the proposals are adopted without substantive change.

Proposal 2-110. No unfavorable comments were received on the proposal to add a new § 27.733(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-111. Based on a comment received, the proposed change to § 27.787 has been revised to avoid any implication that lamps will be required in cargo compartments.

Proposal 2-112. No unfavorable comments were received on the proposal to add a new § 27.801. Accordingly, the proposal is adopted without substantive change.

Proposal 2-113. Several commentators stated that the ditching emergency exit standards proposed for §§ 27.807(d) and 29.807 should not be applicable to all rotorcraft. The commentators noted that the new standards would unnecessarily penalize rotorcraft that would never be involved in a ditching situation. The FAA agrees that certain rotorcraft may not operate in areas where ditching is a concern. Compliance with the ditching emergency exit standards should not be required for all rotorcraft during type certification. Therefore, the proposals as adopted have been revised to make it applicable only to rotorcraft for which ditching certification is requested. The overhead hatch requirements proposed in new §§ 27.807(d)(2) and 29.807(d)(3) are withdrawn because of the possible hazards associated with a turning main rotor. In addition, the reference in proposed § 27.807(d) to § 27.807(a) has been deleted as unnecessary, and the reference in proposed § 29.807(d) to § 29.807(c) has been deleted as inappropriate.

Proposal 2-114. For comments related to the proposed amendment of § 27.853, see Proposal 2-18.

Proposal 2-115. Upon further FAA review proposed §§ 27.865(a) and 29.865(a) concerning external load attaching means have been revised to preclude the necessity of considering the application of an external load at angles that will not be obtained in service. One commentator objected to the requirement for a manual mechanical control for the quick-release device. The commentator stated that this requirement was too restrictive due to the other standby electrical systems available. The FAA does not agree. Contrary to the commentator's contention the reliability of controls other than manual mechanical controls have not been sufficiently substantiated to permit their use in place of an manual mechanical control.

Proposal 2-116. One commentator objected to the proposals to add new standards concerning turbine engine installations to §§ 27.903 and 29.903 that would be substantively identical to proposed § 23.903(b). The commentator requested that the proposals be withdrawn since helicopter service experience does not indicate that such a standard is necessary and due consideration has not been given to the differences between helicopter and airplane engine control systems. The FAA disagrees. While there are differences between helicopter and airplane engine installations, the FAA believes that the proposals would provide general design requirements relating to engine operating limitations and engine installation requirements and that these engine installation requirements should be paralleled in Parts 23, 27, and 29. Also see Proposal 2-19.

Proposal 2-117. For comments concerning proposed § 27.917(d), see Proposal 2-163.

Proposal 2-118. The proposed change to § 27.927 concerning the torque transmission test is related to a proposed amendment to § 27.927 that is contained in Airworthiness Review Program, Notice No. 3: Powerplant Proposals (Notice 75-19; 40 FR 21866; May 19, 1975). The proposed amendment to § 27.927 contained in Notice No. 2 is therefore deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-19. Comments submitted for Proposal 2-118 will be considered at that time.

Proposal 2-119. No unfavorable comments were received on the proposal to add a new § 27.939(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–120. No unfavorable comments were received on the proposal to amend § 27.977. Accordingly, the proposal is adopted without substantive change.

Proposal 2–121. Two commentators objected to the proposals to amend §§ 27.999(b) and 29.999(b) to require the installation of quick actuation type drain valves that are readily accessible, which can be easily opened and closed, and is either located or protected so that it will not be damaged in the event of a landing with landing gear retracted. The commentators stated that the requirement to include crash landing consideration is not considered appropriate since there are a great number of other areas which must be covered in crash landing conditions. The proposals, however, would require that the fuel system drain valves be either located or protected so that it will not be damaged in the event of a landing with landing gear retracted. There are no requirements in the proposal for consideration of crash landing conditions.

In consideration of comments discussed under Proposals 2–26, and 2–70, §§27.999(b)(3)(ii) and 29.999(b)(3)(ii), as adopted, have been clarified to more specifically provide a design consideration.

See Proposals 2–26 and 2–70.

Proposal 2–122. No unfavorable comments were received on the proposal to amend § 27.1043(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2–123. No unfavorable comments were received on the proposal to add a new § 27.1093(c). The proposal as adopted has been editorially changed to agree with the format of the current section.

Proposal 2–124. No unfavorable comments were received on the proposal to add a new § 27.1123. Accordingly, the proposal is adopted without substantive change.

Proposal 2–125. No unfavorable comments were received on the proposal to add a new § 27.1143(d), and the proposal is adopted without substantive change. However, the heading of § 27.1143 has been amended to reflect the contents of the section after the adoption of a new paragraph (d).

Proposal 2–126. No unfavorable comments were received on the proposal to amend § 27.1185. Accordingly, the proposal is adopted without substantive change.

Proposal 2–127. For comments related to proposed amendment of § 27.1322, see Proposals 2–34 and 2–82.

Proposal 2–128. The proposed change to § 27.1325 concerning the static pressure sources is related to a proposed amendment to § 27.1325 that is contained in Airworthiness Review Program, Notice No. 5: Equipment and Systems. Proposals (Notice 75–23; 40 FR 23048; May 27, 1975). The proposed amendment to § 27.1325 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–23. Comments submitted for Proposal 2–128 will be considered at that time.

Proposal 2–129. The proposal for a new § 27.1329 concerning the standards for automatic pilot systems is related to a proposed new § 27.1311 that is contained in Airworthiness Review Program, Notice No. 5: Equipment and System Proposals (Notice 75–23; 40 FR 23048; May 27, 1975). The proposal for § 27.1329 contained in Notice No. 2 is therefore being deferred until final rulemaking is taken with respect to the related proposal in Notice 75–23. Comments for Proposal 2–129 will be considered at that time.

Proposal 2–130. No unfavorable comments were received on the proposal to amend § 27.1351. Accordingly, the proposal is adopted without substantive change.

Proposal 2–131. Proposed § 27.1353(f) concerning nickel-cadmium batteries is related to a proposed amendment to § 27.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75–25; 40 FR 24664; June 9, 1975). The proposed amendment to § 27.1353(f) contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75–25. Comments submitted for Proposal 2–131 will be considered at that time.

Proposal 2–132. For comments related to the proposed amendment of § 27.1385 and the withdrawal of the proposal, see Proposal 2–89

Proposal 2–133. No unfavorable comments were received on the proposal to amend § 27.1411. Accordingly, the proposal is adopted without substantive change.

Proposal 2-134. No unfavorable comments were received on the proposal to amend § 27.1415(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2-135. The proposed change to § 27.1545 concerning the V_{ne} requirements is related to a proposed amendment to § 27.1505 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to § 27.1545 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-135 will be considered at that time.

Proposal 2-136. For comments related to the proposed amendment of § 27.1549, see Proposal 2-42.

Proposal 2-137. No unfavorable comments were received on the proposal to amend § 27.1555(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-138. No unfavorable comments were received on the proposal to amend § 27.1557(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-139. The proposed change to § 27.1581 concerning the Airplane Flight Manual is related to a proposed amendment to § 27.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to § 27.1581 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-139 will be considered at that time.

Proposal 2-140. The proposed change to § 27.1587 is related to a proposed amendment to § 27.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to § 27.1587 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-140 will be considered at that time.

Proposal 2-141. One commentator suggested that the proposed new § 29.25(c) provisions be limited to category B rotorcraft. However no reason for the suggestion was stated. The FAA knows of no reason why the proposed provisions should be limited to category B rotorcraft. One commentator questioned the applicability of proposed new § 29.25(c) and noted that a clarification of the applicable flight requirements was needed. For discussion of this and other comments related to the proposed new § 29.25(c), see Proposal 2-99.

Proposal 2-142. No unfavorable comments were received on the proposal to amend § 29.63. Accordingly, the proposal is adopted without substantive change.

Proposal 2-143. Several commentators recommended that § 29.67(a)(1) be revised by adding the term "at V_{TOSS}" following the words "feet per minute", and by deleting the phrase "without ground effect". Although paragraph (a)(1)(iv) of § 29.67 as proposed defines the speed to be used in meeting the climb requirements of § 29.67(a)(1) as the takeoff safety speed, the FAA does not believe that the term "V_{TOSS}" is appropriate. Also the FAA does not agree that the phrase "without ground effect" should be deleted from § 29.67(a)(1). The FAA requires that all climb performance be conducted outside the influence of ground effect. Accordingly, the proposal is adopted without substantive change.

Proposal 2-144. No unfavorable comments were received on the proposal to amend § 29.71. Accordingly, the proposal is adopted without substantive change.

Proposal 2-145. No unfavorable comments were received on the proposal to amend § 29.75(b)(2). Accordingly, the proposal is adopted without substantive change.

Proposal 2-146. No unfavorable comments were received on the proposal to amend § 29.141. Accordingly, the proposal is adopted without substantive change.

Proposal 2-147. No unfavorable comments were received on the proposal to amend § 29.173(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2-148. No unfavorable comments were received on the proposal to amend § 29.175(d)(2)(iv). Accordingly, the proposal is adopted without substantive change.

Proposal 2-149. For comments related to the proposed amendment of § 29.397, see Proposal 2-106.

Proposal 2-150. No unfavorable comments were received on the proposal to add a new § 29.563. Accordingly, the proposal is adopted without substantive change.

Proposal 2-151. No unfavorable comments were received on the proposal to amend § 29.603. Accordingly, the proposal is adopted without substantive change.

Proposal 2-152. For comments related to the proposed amendment of § 29.685(a), see Proposal 2-109.

Proposal 2-153. No unfavorable comments were received on the proposal to add a new § 29.783(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-154. The proposed change to § 29.783 concerning the requirements applicable to "airstair doors" in transport category rotorcraft is related to proposed amendments to § 25.783 that are contained in Airworthiness Review Program, Notice No. 2: Miscellaneous Proposals (Notice 75-10; 40 FR 10802; March 7, 1975) and in Airworthiness Review Program, Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75-31; 40 FR 29410; July 11, 1975). The proposed amendment to § 25.783 contained in Notice 75-10 is being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-31. The proposed amendment to § 29.783 contained in Notice 75-10 is therefore being deferred until final rulemaking action is taken with respect to the related proposal for § 25.783. Comments submitted for Proposal 2-154 will be considered at that time.

Proposal 2-155. No unfavorable comments were received on the proposed new § 29.787(d). However, based on a comment received on Proposal 2-111, this proposal has been revised to avoid any implication that lamps will be required in cargo compartments.

Proposal 2-156. No unfavorable comments were received on the proposal to add a new § 29.801. Accordingly, the proposal is adopted without substantive change.

Proposal 2-157. For comments related to the proposed amendment § 29.807, see Proposal 2-113.

Proposal 2-158. No unfavorable comments were received on the proposal to add a new § 29.813(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-159. One commentator objected to the proposed change to § 29.815 for the same reasons as presented for the proposed change to § 25.815. The discussion of § 25.815 in Proposal 2-62 deals with this comment.

Proposal 2-160. For comments related to the proposed amendment of § 29.853, see Proposal 2-18.

Proposal 2-161. For comments related to the proposed new § 29.865, see Proposal 2-115.

Proposal 2-162. No unfavorable comments were received on the proposal to amend § 29.903(c)(1). Accordingly, the proposal is adopted without substantive change. For comments related to the proposal to add new standards concerning turbine engine installation, see Proposals 2-19 and 2-116.

Proposal 2-163. The only public comment received in response to proposed §§ 27.917(d) and 29.917(a) recommended that the present language in § 29.917(a) be used but gave no reason for the recommendation. The FAA believes that there should be a positive description of the cooling fans that must be considered as part of the rotor drive system. Accordingly, the proposals are adopted without substantive change.

Proposal 2-164. The proposed change to § 29.927 concerning the torque transmission test time is related to a proposed amendment to § 29.927 that is contained in Airworthiness Review Program, Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75-31; 40 FR 29410, July 11, 1975). The proposed amendment to § 29.927 contained in Notice No. 2 is therefore deferred until final rulemaking section is taken with respect to the related proposal in Notice 75-31. Comments submitted for Proposal 2-164 will be considered at that time.

Proposal 2-165. No unfavorable comments were received on the proposal to amend § 29.931. Accordingly, the proposal is adopted without substantive change.

Proposal 2-166. No unfavorable comments were received on the proposal to add a new § 29.939(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-167. No unfavorable comment was received on the proposal to amend § 29.951(a). Accordingly, the proposal is adopted without substantive change. Also see proposal 2-68.

Proposal 2-168. No unfavorable comments were received on the proposal to amend § 29.997. Accordingly, the proposal is adopted without substantive change.

Proposal 2-169. Based on comments concerning proposed changes to § 25.979, proposed new paragraphs (d) and (e) of § 29.979 have also been revised. See Proposal 2-69 for a discussion of the amendment to § 25.979.

Proposal 2-170. One commentator objected to the proposal to § 29.999 on the basis that the helicopter accident records do not show "any great number due to operators not draining fuel sumps." The FAA believes that this low accident rate due to water contamination in the fuel exists because most helicopters already use quick actuation drain valves.

On commentator questioned the need for proposed § 29.999(b) noting that current § 29.971(d) appears to have the same requirement. The FAA agrees that current § 29.971(d) would be redundant for fuel tank sump drains and has therefore deleted the standards for the fuel tank slump drain in § 29.971(d).

The fuel drain standards in § 29.999(b) as proposed are applicable to each drain required by § 29.999(a) including the drains prescribed in § 29.971, but to avoid misinterpretation the section as adopted is clarified to specifically note the fuel tank sump drains prescribed in § 29.971.

Also see Proposals 2-26, 2-70, and 2-121.

Proposal 2-171. One commentator stated that proposed § 29.1041(a) should be revised to except "ground use only" auxiliary power units (APU's). The FAA disagrees. APU's that are permitted to operate only on the ground have inadvertently continued to operate in flight. Safe operation of APU's requires consideration of ground, water, and flight operating conditions. The proposal is therefore, adopted without substantive change.

Proposal 2-172. No unfavorable comments were received on the proposals to amend § 29.1043(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-173. No unfavorable comments were received on the proposal to add a new § 29.1093(c). The proposal as adopted has been editorially changed to agree with the format of the current section.

Proposal 2-174. For comments related to the proposed amendment of § 29.1125, see Proposals 2-29 and 2-75.

Proposal 2-175. No unfavorable comment was received on the proposal to amend § 29.1143 and the proposal is adopted without substantive change. However, the heading of § 29.1143 has been amended to reflect the contents of the section after the addition of a new paragraph (e).

Proposal 2-176. No unfavorable comments were received on the proposal to amend § 29.1165(f). Accordingly, the proposal is adopted without substantive change.

Proposal 2-177. Two commentators objected to the selective use of Part 33 requirements in the proposal for a new § 29.1167 that would provide substantiation requirements for accessory gearboxes that are not certificated as part of an engine. The FAA proposed to amend Part 29 like Part 25 for consistency. The FAA now believes that the proposed new § 29.1167 is inappropriate in view of the requirements to substantiate the rotor drive system including gearboxes under the rotor drive system endurance test requirements. Therefore, proposed new § 29.1167 is withdrawn.

Proposal 2-178. No unfavorable comments were received on the proposal to amend § 29.1189(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2-179. No unfavorable comments were received on the proposal to amend § 29.1197(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2-180. For comments related to the proposed amendment of § 29.1303(d), see Proposal 2-79.

Proposal 2-181. No unfavorable comments were received on the proposal to amend § 29.1307. Accordingly, the proposal is adopted without substantive change.

Proposal 2-182. For comments related to proposed amendment of § 29.1322, see Proposals 2-34 and 2-82.

Proposal 2-183. For comments related to the deferral of proposed § 29.1325, see Proposal 2-35.

Proposal 2-184. The proposed change to § 29.1329 concerning automatic pilot systems is related to a proposed new § 29.1311 that is contained in Airworthiness Review Program, Notice No. 5: Equipment and Systems Proposals (Notice 75-23; 40 FR 23048; May 27, 1975)). The proposal for § 29.1329 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-23. Comments submitted for Proposal 2-184 will be considered at that time.

Proposal 2-185. The proposed change to § 29.1337 concerning the auxiliary power unit instrument lines is related to a proposed amendment to § 29.1337 that is contained in Airworthiness Review Program, Notice No. 3: Powerplant Proposals (Notice 75-19; 40 FR 21866, May 19, 1975). The proposed amendments to § 29.1337 contained in Notice No. 2 is therefore deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-19. Comments submitted for Proposal 2-185 will be considered at that time.

Proposal 2-186. Proposed § 29.1353(c)(5) concerning nickel-cadium batteries is related to a proposed amendment to § 29.1585 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664: June 9, 1975). The proposed amendment to § 29.1353(c)(5) contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-186 will be considered at that time.

Proposal 2-187. For comments related to the proposed amendment of § 29.1385 and the withdrawal of the proposal, see Proposal 2-89.

Proposal 2-188. The proposal for § 29.1545 concerning the V_{ne} requirements is related to a proposed amendment to § 29.1505 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to § 29.1545 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-188 will be considered at that time.

Proposal 2-189. For comments related to the proposed amendment of § 29.1549, see Proposal 2-42.

Proposal 2-190. No unfavorable comments were received on the proposal to amend § 29.1555(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-191. No unfavorable comments were received on the proposal to amend § 29.1557(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-192. The proposed change to § 29.1581 concerning the Airplane Flight Manual is related to a proposed amendment to § 29.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to § 29.1581 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-192 will be considered at that time.

Proposal 2-193. No unfavorable comments were received on the proposal to amend § 31.1. Accordingly, the proposal is adopted without substantive change.

Proposal 2-194. No unfavorable comments were received on the proposal to amend §§ 31.11 and 31.20. Accordingly, the proposal is adopted without substantive change.

Proposal 2-195. No unfavorable comment was received on the proposal to add a new § 31.14 concerning weight limits of manned free balloons. Therefore, the section is adopted without substantive change.

Proposal 2-196. No unfavorable comments were received on the proposal to amend § 31.45. Accordingly, the proposal is adopted without substantive change.

Proposal 2-197. No unfavorable comments were received on the proposal to add a new § 31.46. Accordingly, the proposal is adopted without substantive change.

Proposal 2-198. No unfavorable comments were received on the proposal to amend § 31.63. Accordingly, the proposal is adopted without substantive change.

Proposal 2-199. No unfavorable comments were received on the proposal to amend § 31.85. Accordingly, the proposal is adopted without substantive change.

Proposal 2-200. No unfavorable comments were received on the proposal to amend § 33.1. Accordingly, the proposal is adopted without substantive change.

Proposal 2-201. No unfavorable comments were received on the proposal to amend § 35.1. Accordingly, the proposal is adopted without substantive change.

Proposal 2-202. No unfavorable comments were received on the proposal to amend § 35.39. Accordingly, the proposal is adopted without substantive change.

Proposal 2-203. No unfavorable comments were received on the proposal to amend § 35.41(e). Accordingly, the proposal is adopted without substantive change.

Proposal 2-204. No unfavorable comments were received on the proposal to amend § 35.45(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2-205. No unfavorable comments were received on the proposal to amend § 91.14. Accordingly, the proposal is adopted without substantive change.

Proposal 2-206. No unfavorable comments were received on the proposal to amend § 91.21(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2-207. One commentator suggested that the proposed change to § 91.33(d)(6) concerning clock requirements should use the language of § 121.305. The FAA believes that a standard should be specified in § 91.33(d)(6) for digital clocks and the proposal as adopted provides a specific standard. See Proposal 2-79.

Proposal 2-208. The intent of the proposed new § 91.193(g) is to require protective breathing equipment that would meet the standards proposed for § 25.1439(b) on certain airplanes operated under Part 91 Subpart D. Based on the current testing being conducted on this type of equipment, the FAA is developing new standards for a later rulemaking action. The proposal for § 25.1439(b)(2)(ii) is being withdrawn (See Proposal 2-91). Therefore, the FAA believes that the proposal for § 91.193 is premature, and the proposal is withdrawn.

Proposal 2-209. Although no unfavorable comment was received on the proposed revision of § 91.209, the FAA believes that revision of similar ice protection provision in § 135.85 may be necessary. Amendments to §§ 91.209 and 135.85 should be considered together. Therefore, the proposed change to § 91.209 is withdrawn.

Proposal 2-210. No unfavorable comments were received on the proposal to amend § 121.171(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2-211. No unfavorable comments were received on the proposal to amend § 121.199. Accordingly, the proposal is adopted without substantive change.

Proposal 2-212. No unfavorable comments were received on the proposal to amend §§ 121.331(b) and 121.333(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2-213. The intent of proposed § 121.337(d) is to require protective breathing equipment that would meet the proposed requirements of § 25.1439(b) installed in certain airplanes operated under Part 121. However, proposed § 25.1439(b)(2)(ii) is withdrawn in this notice. Based on the current testing being conducted on this type of equipment, the FAA is developing new standards for a later rulemaking action. The FAA therefore believes that the proposed change to § 121.337 is premature and the proposal is withdrawn. Also see Proposal 2-91.

Proposal 2-214. No unfavorable comments were received on the proposal to amend § 127.105. Accordingly, the proposal is adopted without substantive change.

Proposal 2-215. No unfavorable comments were received on the proposal to add a new § 127.106. Accordingly, the proposal is adopted without substantive change.

Proposal 2-216. One commentator objected to the proposed amendment to § 133.1. The commentator stated that the proposal specifically eliminates the reference to airworthiness certification rules when, in fact, Subpart D is retained intact except for the standards for external-load attaching means and quick-release devices. The FAA agrees that reference to airworthiness requirements should not be deleted without other changes to Part 33, and the proposal is withdrawn.

Proposal 2-217. One commentator objected to the proposed amendment to § 133.41 (c)(6). However no reason for the objection was stated. The proposal is therefore adopted herein without substantive change.

Proposal 2-218. One commentator requested that proposed § 133.43(a) be revised to provide for the use of external-load attaching means previously approved under Part 133. The FAA agrees and proposed § 133.43 is revised accordingly.

Proposal 2-219. No unfavorable comments were received on the proposal to amend § 133.45(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-220. No unfavorable comments were received on the proposal to amend § 135.71(a)(5). Accordingly, the proposal is adopted without substantive change.

Proposal 2-221. Based upon further review by the FAA proposed § 135.165(b)(2) is being withdrawn because contrary to the explanation for the proposal in Notice 75-10, the proposal would result in unjustifiably different standards for transport category airplanes operated under Part 135 and those operated under Part 121.

(Secs. 313(a), 601, 603, and 605 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425); sec. 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c))

In consideration of the foregoing, and for the reasons stated in Notice 75-10, Parts 21, 23, 25, 27, 29, 31, 33, 35, 91, 121, 127, 133, and 135 of the Federal Aviation Regulations are amended as follows, effective February 1, 1977.

The Federal Aviation Administration has determined that this document does not contain a major proposal requiring preparation of an Inflation Impact Statement under Executive Order 11821 and OMB Circular A-107.

Amendment 21-45

Issuance of Special Flight Permits with a Continuing Authorization to Air Taxi Operators of Large Aircraft

Adopted: September 21, 1977 **Effective: October 28, 1977**

(Published in 42 FR 51561, September 29,1977)

SUMMARY: This amendment provides for the issuance of special flight permits with a continuing authorization to air taxi operators of large aircraft. In the past, these operators have been required to apply for special flight permits individually before operating their large aircraft, that might not meet applicable airworthiness requirements but are capable of safe flight, to a base where maintenance or alterations are to be performed. Since air taxi operators of large aircraft must maintain their large aircraft under a continuous airworthiness maintenance program and their operations must be covered under operations specifications, the requirements that these operators must apply for special flight permits individually is not necessary.

FOR FURTHER INFORMATION CONTACT:

Raymond E. Ramakis, Regulatory Projects Branch, Safety Regulations Division, Flight Standards Service, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591; Telephone (202) 755-8716.

SUPPLEMENTARY INFORMATION:

Section 21.197(c) provides, in pertinent part, for the issuance of a special flight permit with a continuing authorization to Part 121 and 127 certificate holders. Special flight permits, with continuing authorizations, that are issued pursuant to § 21.197(c), are included in the certificate holder's operations specifications, along with the conditions and limitations associated with the authorization. The purpose of § 21.197(c) is to eliminate the unnecessary burden, on Part 121 and 127 certificate holders and the FAA, of individually dealing with each of a relatively large number of special flight permits that those operators need for ferrying aircraft to bases where maintenance can be performed. By virtue of the continuous airworthiness maintenance program used by these operators and their operations specifications, procedures have been established to provide for the issuance of special flight permits with continuing authorizations for such ferry flights while ensuring that the flights are conducted safely.

Air taxi operators of large aircraft are required by § 135.2 to comply with the certification and operation requirements for supplemental air carriers as set forth in Part 121, unless compliance with the Part 121 rules applicable to domestic or flag carriers is required under specified circumstances. In any event, large aircraft operated under the provision of § 135.2 must be maintained under a continuous airworthiness maintenance program and operations conducted under § 135.2 must be covered in the certificate holder's operations specifications as provided in Part 121. Therefore, the reasons for providing for the issuance of special flight permits with continuing authorizations to Part 121 and 127 certificate holders are equally applicable to air taxi operators operating under the provisions of § 135.2 with respect to their large aircraft.

This amendment is based on a Notice of Proposed Rule Making (Notice No. 76-8) published in the Federal Register on April 5, 1976, (41 FR 14392) which proposed to provide for the issuance of special flight permits with a continuing authorization to air taxi operators of large aircraft. That Notice invited comment by all persons interested in the making of the proposed rule. All interested persons have been afforded an opportunity to participate in the making of this amendment, and due consideration has been given to all matter presented. Three commentators responded to Notice 76-8, none of which expressed disapproval of the intent of the proposal. However, one commentator suggested that rather than issuing a continuing authorization to operators, the FAA should amend the regulation to allow such operations without the necessity of obtaining a special permit. The FAA does not agree with this proposed change since the aircraft involved may not meet airworthiness requirements and special operating restrictions may be necessary which would be covered in special flight permits. This amendment is the same as proposed in Notice 76-8.

The principal authors of this document are Mr. H. Keyzer-Andre, Flight Standards Service, and Mr. Phillip Kolczynski and Mr. Samuel Podberesky, Office of the Chief Counsel.

ADOPTION OF AMENDMENT

Accordingly, Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended effective October 28, 1977, by revising § 21.297(c).

[Secs. 313(a), 601, 603 and 604, Federal Aviation Act of 1958, as amended, (49 U.S.C. 1354(a), 1421, 1423, and 1424); and Sec. 6(c), Department of Transportation Act (49 U.S.C. 1655(c))].

The Federal Aviation Administration has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Order 11821, as amended by Executive Order 11949, and OMB Circular A-107.

Amendment 21-46

Airworthiness Review Program

Amendment No. 6: Flight Amendments

Adopted: January 9, 1978 **Effective: March 1, 1978**

(Published in 43 FR 2302, January 16, 1978)

SUMMARY: The purpose of these amendments to the Federal Aviation Regulations is to update and improve—(1) the airworthiness standards applicable to aircraft performance, flight characteristics, flight manuals, and operating limitations; (2) the operating rules containing related airworthiness standards; and (3) the rules governing holders of type certificates. These amendments are part of the Airworthiness Review Program.

FOR FURTHER INFORMATION CONTACT:

Adolfo O. Astorga, Airworthiness Review Branch (AFS-910), Flight Standards Service, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591; telephone (202) 755-8714.

SUPPLEMENTARY INFORMATION: These amendments are the sixth in a series of amendments to be issued as part of the Airworthiness Review Program. The following series of amendments have previously been issued as part of this Airworthiness Review Program:

Title	*FR citation*
Form number and clarifying revisions.	(40 FR 2576; Jan. 14, 1975).
Rotorcraft anticollision light standards.	(41 FR 5290; Feb. 5, 1976).
Miscellaneous amendments.	(41 FR 55454; Dec. 20, 1976).
Powerplant amendments.	(42 FR 15034; March 17, 1977).
Equipment and systems amendments.	(42 FR 36960; July 18, 1977).

These amendments are based on two Notices of Proposed Rule Making—Notice 75-10 published in the FEDERAL REGISTER on March 7, 1975 (40 FR 10802); and Notice 75-25 published in the FEDERAL REGISTER on June 9, 1975 (40 FR 24664). The amendments based on Notice 75-10 were deferred in the series of amendments titled "Miscellaneous Amendments" so that they could be considered with the final disposition of certain proposals in Notice 75-25. The discussions of the comments received for the deferred proposals are included under the heading of the related Notice 75-25 proposals.

Interested persons have been afforded an opportunity to participate in the making of these amendments and due consideration has been given to all matters presented. A number of substantive changes and changes of an editorial and clarifying nature have been made to the proposed rules based upon relevant comments received and upon further review within the FAA. Except for minor editorial and clarifying changes and the substantive changes discussed below, these amendments and the reasons for them are the same as those contained in Notices 75-10 and 75-25.

DISCUSSION OF COMMENTS

The following discussion is keyed to the like-numbered proposals contained in Notice 75-25.

Proposal 6-1. No unfavorable comments were received on the proposal to amend § 1.1 by deleting the term "Accelerate-stop distance" and its definition. Accordingly, the proposal is adopted without substantive change.

Proposal 6-2. For a comment related to the proposal to amend § 1.2, see Proposal 6-34.

Proposal 6-3. One commentator suggested that proposed new § 21.5 concerning Airplane and Rotorcraft Flight Manuals be revised to make clear that other titles for the required Flight Manual, such as Pilot's Operating Handbook, will continue to be approved. The FAA has no objection to the use of the term Pilot's Operating Handbook as the main title. However, if an applicant chooses to use the title Pilot's Operating Handbook, he must include a statement on the title page indicating that the document is the FAA-required Airplane or Rotorcraft Flight Manual.

The same commentator pointed out that on airplanes of types for which Flight Manuals were not furnished in the past, much of the required information was furnished on placards and markings, and that, if this proposal is adopted, some of the placards would no longer be needed but would still be part of the airplane's certification basis. The FAA agrees that some placards may not be necessary after the information is furnished in a Flight Manual. However, application may be made to change the type design if the applicable regulations only require that the material be in either a Flight Manual or in any combination of approved manual materials, markings, and placards.

The same commentator also stated that proposed § 21.5(b) would penalize airplanes that were designed and tested to temperatures higher than the hot day condition prescribed in § 23.1043(b)(1). The FAA does not agree because the temperature for which cooling was demonstrated would be furnished in the Flight Manual as information, not as a limitation. It should be noted that, in response to Proposal 6-29, this commentator stated that there is no objection to furnishing the test temperature if it is not a limitation.

Two commentators stated that it should be made clear that, for rotorcraft originally certificated with a flight manual, the manual originally approved need not be revised to include the new requirements of this proposal. The FAA does not believe a revision is necessary since proposed § 21.5(b), in conjunction with proposed § 21.5(a), refers only to airplanes or rotorcraft that were not type certificated with an Airplane or Rotorcraft Flight Manual.

Another commentator said that requiring Flight Manuals to be furnished for aircraft previously type certificated without a Flight Manual places too large a burden on the holders of these type certificates. The FAA does not agree since the information to be included in the Flight Manual has already been furnished in other forms. In addition, a Flight Manual would provide the operator with essential information in a consolidated, organized form suitable for study and reference. The FAA believes that these benefits outweigh the burden of preparing and printing the Manual.

One commentator, who concurred with the proposal, recommended that the turbulent air penetration speed, least angle of glide speed, and least rate of descent speed (power off) be added to the required information. These are specific requirements which are not applicable to all categories of aircraft and the FAA does not believe they should be included in the rule.

The phrase "maximum anticipated air temperature" in proposed § 21.5(b)(2) is deleted and the phrase "maximum ambient atmospheric temperature" is inserted in its place to be consistent with Proposal 6-20 to amend § 23.1043 and the corresponding proposals for the other certification parts, which are being adopted in this series of amendments.

The proposal to add a new § 21.5 is adopted with the revision discussed above.

Proposal 6-4. For comments related to the proposal to amend § 23.25(b), see Proposal 6-5. The proposal to amend § 23.25(b) is adopted without substantive change.

Proposal 6-5. One commentator objected to the proposal to amend § 23.29, which would require the empty weight to be determined with "full" operating fluids, on the ground that this procedure would eliminate the option of "off loading" oil in order to maintain weight and center of gravity limits. The FAA does not agree. This option would not be eliminated by proposed § 23.29 since it merely establishes a new reference basis for empty weight. The same commentator stated that since this proposed rule is not retroactive, confusion will result because some aircraft will have oil included in the weight and balance and others will not. This commentator also suggested that the use of the same definition of empty weight by the FAA and the military would eliminate the difficulties encountered by pilots operating both military and civil aircraft. The FAA does not believe that the proposed change will cause confusion or difficulty in either situation cited by the commentator since the weight and balance data accompanying each airplane will specify whether oil is included in the empty weight. Further, this procedure should simplify weight and balance computations since fluids normally included will be accounted for without further additions to the empty weight.

One commentator objected to the proposals to amend §§ 27.29 and 29.29 on the ground that there is no benefit to be gained by changing the definition of empty weight. The FAA does not agree with this comment for the reasons stated in the Notice for these proposals. This commentator further objected to the proposal to amend § 27.29 on the ground that it would create a problem for helicopters that have a larger oil tank capacity than is required under all conditions, such as helicopters designed to accept auxiliary fuel tanks. The option of off-loading oil would not be eliminated by proposed § 27.29. In addition, the FAA believes that the change will accomplish its purpose of simplifying weight and balance computations for the great majority of helicopters.

Several commentators on the proposal to amend § 25.29 noted that the proposed rule would require certain fluids which, in transport category airplanes, are variable as a function of individual operator or mission requirements and of passenger seating density (such as potable water and lavatory pre-charge fluids) to be included in the empty weight. It was suggested that an exception be provided for those fluids that vary with operation or mission as well as those that are expendable in flight such as water intended for injection in the engines. The FAA believes that exceptions for the specific fluids noted are warranted for airplanes, but the FAA does not believe that an exception is appropriate for potable water or lavatory pre-charge water for rotorcraft. The proposals to amend §§ 23.29 and 25.29 are revised accordingly.

Proposal 6–6. A commentator objected to the proposed change to § 23.45, stating that a requirement to correct the performance to 80 percent relative humidity is not necessary, that it would increase the cost and complexity of certification without any increase in safety, and that it will create a new standard atmosphere that will result in confusion as to the basis for engine performance data. The power loss that is associated with changing from dry air to air at 80 percent relative humidity would cause a significant reduction in the climb performance of a reciprocating-engine powered airplane and should be considered. This reduction would be most evident where performance is marginal, e.g., during one-engine-inoperative climb. With regard to turbine engines, the FAA believes that the effect of humidity may be negligible on some types of engines, in which case no performance correction would be necessary. However, for some other types of turbine engines, a correction for humidity will increase the accuracy of the performance data. The FAA believes that the data required for making the corrections can be obtained simply and with inexpensive instrumentation. Further, the FAA does not believe that requiring a correction for humidity in the performance data for newly type-certificated airplanes will result in confusion. A transition period may exist during which the performance data for newly type-certificated airplanes will be corrected for humidity and that for other airplanes may not be. Such transition periods inevitably occur with the adoption of new regulatory provisions and the FAA does not believe that the transition in this case will present a significant problem.

The commentator further stated that present performance measurement accuracy is within the range of uncontrolled airplane-to-airplane variations, atmospheric variations other than humidity, and piloting variations, and that eliminating one variable whose effect is within the spread of other variables is not justifiable on a simple cost-benefit analysis. The FAA does not agree that the humidity correction should be omitted on the basis of conjecture that other variables may mask its effect. Certification flight testing is not allowed when atmospheric variables would affect data accuracy, and tests must be repeated as necessary to establish confidence in data accuracy.

In regard to the burden of correcting for humidity in type certification, the FAA believes that it should in many cases be possible to show that the effect of humidity is not significant or that it is covered by a conservative correction factor. Correction of performance data to standard atmospheric conditions of temperature and pressure is required in any case, and an additional correction for humidity should be a relatively small burden.

The proposal for § 23.45 is adopted without substantive change.

Proposal 6–7. No unfavorable comments were received on the proposal to amend § 23.49. Accordingly, the proposal is adopted without substantive change.

Proposal 6–8. One commentator suggested that, for consistency with certain foreign requirements, proposed §§ 23.51(c)(1)(ii) and (c)(2)(i) should be revised to read 1.2 V_{S_1}, instead of 1.3 V_{S_1}. The FAA does not believe that the recommended change is necessary. Proposed §§ 23.51(c)(1)(ii) and (c)(2)(i) already provide for a speed less than 1.3 V_{S_1}.

The first commentator also stated that proposed § 23.51(c)(1)(ii) should be revised so that it refers to the complete failure of a single engine (on multi-engine airplanes) instead of complete engine failure which would introduce a double failure concept not inherent in these rules. The FAA does not agree. Proposed § 23.51(c)(1)(ii), which is consistent with current § 23.51(a)(2)(ii) in this regard, only requires that "complete engine failure" be investigated if a speed of less than 1.3 V_{S_1} is demonstrated at a height of 50 feet. In addition, current § 23.51(a)(2)(ii) has been consistently interpreted to require that for multi-engine airplanes which meet the powerplant isolation requirements of § 23.903(c) in the takeoff configuration, only one engine need be made inoperative in the specified investigations.

One commentator objected to the extension of takeoff performance determination requirements to airplanes of 6,000 pounds and less maximum weight, for reasons stated in his comments on Proposal 6-3 concerning Flight Manuals. For a discussion of these comments, see Proposal 6-3.

Another commentator recommended that those provisions of the existing rule which relate to nosewheel and tailwheel liftoff speeds be retained and that their applicability be extended to all airplanes. These provisions were originally imposed in lieu of a requirement for approved takeoff performance data for airplanes of 6,000 pounds and less maximum weight. In view of the requirements which are being adopted, and in view of satisfactory service history for airplanes of more than 6,000 pounds maximum weight, the FAA does not believe these provisions should be retained or that their applicability should be extended to all airplanes.

The proposal to revise § 23.51 is adopted without substantive change.

Proposal 6-9. One commentator objected to the application of proposed § 23.65, concerning all-engines operating climb requirements, to airplanes of 6,000 pounds or less maximum weight for reasons stated in his comments on Proposal 6-3 concerning Flight Manuals. For a discussion of these comments, see Proposal 6-3.

Another commentator stated that use of a reduced propeller pitch under proposed § 23.65(b) is not consistent with safety requirements, because it would either deny the pilot performance in actual operation or the protection of limiting the engine to a safe speed. The FAA does not agree. Present § 23.33 defines the pitch and speed limitations for propellers which are to be used in service. Proposed § 23.65(b), which is identical to the present § 23.65(a)(2), merely authorizes the use of a special test propeller pitch setting if it is necessary, to obtain rated engine r.p.m. at V_Y.

In proposed § 23.65(c), reference to the airplane configuration was inadvertently omitted. The configuration should be the same as that specified in proposed § 23.65(a), and proposed § 23.65(c) is therefore revised to state that the climb gradient is to be met with the airplane in the configuration prescribed in paragraph (a). In addition, § 23.65(a)(4) is revised to cover means other than cowl flaps for controlling the engine cooling air supply. This change is necessary to provide for turbine engines. The proposal to revise § 23.65 is adopted with the revisions discussed above.

Proposal 6-10. One commentator suggested that a speed to be used in calculating the climb gradients should be specified in proposed § 23.67(c) for purposes of uniformity, but did not make a specific proposal. The FAA believes that the applicant should be allowed to select a climb speed if the airplane meets the minimum gradient and rate of climb at that speed. The proposal to amend § 23.67 is adopted without substantive change.

Proposal 6-11. One commentator objected to the application of proposed § 23.75, concerning landing distance requirements, to airplanes of 6,000 pounds or less maximum weight for reasons stated in his comments on Proposal 6-3 concerning Flight Manuals. For a discussion of these comments, see Proposal 6-3. This commentator also stated that proposed § 23.75(e), concerning wheel brake pressures, is a design requirement and should therefore be placed in Subpart D of Part 23. The FAA does not agree because proposed § 23.75(e) refers to the pressures used in determining the landing performance. The commentator further suggested that the FAA should consider issuing advisory material as to what is considered safe and reliable under proposed § 23.75(f). The wording of proposed § 23.75(f) is the same as that of present § 25.75(b)(3), and this wording has been administered without difficulty for many years. However, the FAA will consider issuing advisory material at a future date if the need is shown.

Another commentator stated that he would not support the inclusion of reverse thrust as an acceptable "other means" of retarding the airplane in determining the landing distance under proposed § 23.75(f), because the landing distance is demonstrated on a dry runway with no provision for a field length factor. The FAA agrees that the effect of wet runways would have to be taken into account in any determination that a means of retarding the airplane is safe and reliable and that consistent results can be expected in service use. It should be noted that proposed § 23.1587(a((6) (Proposal 6–31), as adopted, requires that the kind of surface used in the landing distance tests be described in the Airplane Flight Manual. The proposal to revise § 23.75 is adopted without substantive change.

Proposal 6–12. One commentator objected to the application of proposed § 23.77, concerning balked landing performance, to airplanes of 6,000 pounds or less maximum weight for reasons stated in his comments on Proposal 6–3 concerning Flight Manuals. For a discussion of these comments, see Proposal 6–3. Proposed § 23.77 is adopted without substantive change.

Proposals 6–13 and 2–6. One commentator stated that the option in proposed (and current) § 23.149(a) for the applicant to choose zero yaw or an angle of bank is inconsistent because straight flight with zero yaw (zero sideslip) can only be achieved with some degree of bank. The FAA agrees that bank may be needed to establish straight flight with zero yaw following the failure of a powerplant at low airspeed. The proposed language is the same as that of the current rule and an angle of bank of up to 5 degrees to maintain straight flight has been allowed under the current rule. The directional controllability that must be provided for compliance with §§ 23.147 and 23.205 ensures that bank angles up to 5 degrees under these flight conditions will not be accompanied by excessive yaw angles. Certain design or control features may influence the use of roll control immediately following the failure of a powerplant. Therefore, the proposal (as well as the current rule) allows reference to a zero yaw angle, without bank, for determining the V_{MC} of airplanes which incorporate such features.

Section 23.149(a) is revised in accordance with the discussion of Proposal 6–41 with respect to the modes of failure which must be simulated in demonstrating V_{MC}. The revision requires that the method used to simulate critical engine failure must represent the most critical mode of powerplant failure with respect to controllability that is expected in service, rather than (all) modes of powerplant failure expected in service.

Proposal 2–6 to amend § 23.149(b) (Notice 75–10) was reproposed in Proposal 6–13 for the purpose of clarity. No unfavorable comments were received on proposed §§ 23.149 (b),(c), and (d), and they are adopted without substantive change.

Proposal 6–1¼. One commentator objected to the application of proposed § 23.161 to airplanes of 6,000 pounds and less maximum weight for reasons stated in his comments on Proposal 6–3 concerning Flight Manuals. For a discussion of these comments, see Proposal 6–3.

Since § 23.21(a) requires that each requirement of this subpart must be met at each appropriate combination of weight and center of gravity within the range of loading conditions for which certification is requested, proposed § 23.161(a)(2)(ii) is revised by deleting the reference to center of gravity and proposed § 23.161(c)(2)(iii) is withdrawn.

Proposal 6–15. No unfavorable comments were received on the proposal to amend § 23.177. Accordingly, the proposal is adopted without substantive change. For comments related to the proposal to amend § 23.177, see Proposal 6–16.

Proposal 6–16. One commentator objected to proposed § 23.181(b), which would require that short period lateral or directional oscillations and combined lateral-directional oscillations ("Dutch roll") be damped to 1/10 amplitude in 7 cycles. The commentator stated that this proposal is more stringent with regard to combined lateral-directional oscillations than proposed § 25.181 (Proposal 6–43) and that proposed § 25.181 retains certain necessary requirements for other short period oscillations that are not contained in proposed § 23.181. Proposed § 25.181(a) would require that oscillations other than combined lateral-directional oscillations be heavily damped, and proposed

§ 25.181(b) would require combined lateral-directional oscillations to be positively (but not heavily) damped. The FAA agrees that a similar distinction should be made in § 23.181 between combined lateral-directional ("Dutch roll") oscillations and other longitudinal, lateral, and directional oscillations.

Current §§ 23.177(a)(4) and (b)(3) (which are deleted by Proposal 6-15) require any short period lateral or directional oscillation to be heavily damped. After considering the comment and after further review, the FAA believes that the current requirement for heavy damping should be retained for short period lateral and directional oscillations other than "Dutch roll" (combined lateral-directional) oscillations. With respect to combined lateral-directional oscillations, the FAA believes that these oscillations do not need to be heavily damped and that the proposed requirements for Part 23 airplanes would provide a satisfactory damping ratio.

The FAA believes the difference between Part 23 and Part 25 requirements with respect to combined lateral-directional oscillations is justified since airplanes certificated under Part 25 have very large variations in size, weight, and moment of inertia, which affect the lateral-directional characteristics and pilot reaction to these characteristics. The FAA therefore believes that it is appropriate that the damping requirement in § 25.181(b) be stated in general terms, as reflected in Proposal 6-43.

The proposal to amend § 23.181 is adopted with the revisions discussed above.

Proposal 6-17. Proposed new § 23.183 would establish a limit on the rate of spiral divergence by requiring that the angle of bank may not increase to more than 40 degrees in less than 12 seconds after the controls are released in a 20-degree banked turn under specified conditions. One commentator objected to the proposal stating that no need had been shown for the proposal and that the tests referred to in the notice were not definitive. After comparing available data on the subject of spiral divergence, the FAA believes that rulemaking on this subject is premature. Accordingly, the proposal to add a new § 23.183 is withdrawn.

Proposal 6-18. Many comments were received on the proposal to amend § 23.221. In view of the conflicting views expressed in these comments, and after further consideration by the FAA, the FAA believes that the proposal to amend § 23.221 is premature, and it is withdrawn.

Proposal 6-19. One commentator stated that the proposal to amend § 23.729(f)(1) is redundant and that the requirement proposed is already in effect. The FAA does not agree with the comment for the reasons stated in the notice.

The proposal to amend § 23.729(f)(1) is adopted as proposed except that the last three words, "the aural warning", of the proposed sentence are replaced with the words "the warning device" so that the wording of the sentence is consistent with the remainder of § 23.729(f).

For other comments related to the proposal to amend § 23.729, see Proposal 6-51.

Proposal 6-20. For comments related to the proposal to revise § 23.1043(b), see Proposal 6-23.

Proposal 6-21. One commentator objected to the proposal to amend § 23.1047 for reasons stated in his comments on Proposal 6-3, concerning Flight Manuals. For a discussion of these comments, see Proposal 6-3. The proposal to amend § 23.1047 is adopted without substantive change.

[For discussion concerning new § 23.1353(g), see Proposals 6-57 and 2-87.]

Proposal 6-22. No unfavorable comments were received on the proposal to revise § 23.1501. Accordingly, the proposal is adopted without substantive change.

Proposal 6-23. The proposal to revise § 23.1521(e) is one proposal in a series of proposals on powerplant cooling requirements and ambient temperature operating limitations and information for Parts 23, 25, 27, and 29 aircraft. This series consists of proposals 6-20, 6-23, 6-29, 6-52, 6-54, 6-56, 6-68, 6-71, 6-74, 6-82, 6-85, and 6-88.

Proposed § 23.1521(e) in conjunction with proposed § 23.1043(b) (Proposal 6-20) would require that an ambient temperature operating limitation be established as the maximum atmospheric temperature at which compliance with the powerplant cooling requirements is shown. In response to these proposals, one commentator stated that no justification for safety or other reasons has been presented for establishing the proposed operating limitations, and that he believes that no safety justification exists. The commentator also stated that the FAA cooling tests and correction factors are very conservative, that it would be necessary to correct cooling tests to at least the equivalent of 125 degrees F at sea level to avoid restrictive operating limitations, and that this would result in increased cooling drag and poorer performance. Another commentator, in regard to proposed § 27.1521(f) (Proposal 6–71), also stated that an ambient temperature limitation has not been shown to be necessary.

After considering these comments, and after further review, the FAA believes that it does not now have enough information to justify the proposed requirements for reciprocating engines in Part 23 airplanes and Part 27 rotorcraft. However, because of the differences between reciprocating and turbine engine installations, particularly in regard to engine components and accessories, and because of the effects of high temperature operation on turbines, Part 23 already requires the establishment of ambient temperature limitations for turbine engines, and for the same reasons the FAA believes that ambient temperature limitations for turbine engines should also be established for Part 27 helicopters. Parts 25 and 29 already require temperature limitations for reciprocating engines (as well as turbine engines) because the reciprocating engines in these aircraft are generally more complex than those used in Part 23 and Part 27 aircraft.

Accordingly, proposed §§ 23.1521(e) and 27.1521(f) are revised to require the establishment of ambient atmospheric temperature limitations for turbine but not for reciprocating engines and proposed §§ 25.1521(e) and 29.1521(e) are adopted without substantive change. In addition, proposed §§ 23.1043(b), 25.1043(b), 27.1043(b), and 29.1043(b), as adopted, are revised to omit the reference to a limitation on the operation of the aircraft, since the establishment of ambient temperature operating limitations is prescribed in proposed §§ 23.1521(e), 25.1521(e), 27.1521(f), and 29.1521(e). For reciprocating engines, §§ 23.1587 and 27.1587 are revised to require that the maximum ambient air temperature for which compliance with the eengine cooling requirements was shown must be included in the performance information section of the Flight Manual.

One commentator recommended that the 100-degrees F minimum in proposed § 25.1043 (b) be deleted, since the ambient temperature at which compliance with the cooling requirements is shown becomes an operating limitation on the airplane and airworthiness is not affected as long as the limitation is followed. The FAA believes that the 100-degree F minimum is appropriate since a lower temperature would be impractical and unrealistic considering summer operations in the United States. It should be noted that an exception to the minimum is provided for winterization installations.

This commentator also stated that the explanation for proposed § 25.1043(b) implies that only a test demonstration at 100 degrees F or higher is acceptable. This is incorrect. Section 23.1043(a)(1) and corresponding provisions in Parts 25, 27, and 29 clearly indicate that tests may be conducted under other conditions and corrected to the prescribed conditions.

One commentator recommended the deletion of the requirements in proposed §§ 27.1583(b) and 29.1583(b) for an explanation of the powerplant limitations in the Airplane Flight Manual, since such explanations would be redundant. A similar comment was received in response to proposed § 25.1583(b). The intent of the proposals was not to require an explanation of each limitation. A separate explanation would not be necessary for a limitation that is self-explanatory. For clarification, proposed §§ 23.1583(b)(2), 25.1583(b)(2), 27.1583(b)(2), and 29.1583(b)(2) are revised to require an explanation of limitations "when appropriate."

In regard to proposed § 23.1583(b), one commentator stated that contrary to the FAA statement in the notice, the establishment of the test temperature as a limitation has not been required in the past and should not be a limitation. The FAA disagrees. Current § 23.1583(j) requires that, for turbine engines, the temperatures used in the climb test prescribed in § 23.1043(b)(2), be furnished as operating limitations in the Airplane Flight Manual. Proposed § 23.1583(b) merely makes it clear that any operating limitations that are established under § 23.1521 must be furnished in the Airplane Flight Manual. In view of the adoption of proposed § 23.1583(b) as revised, § 23.1583(j) is deleted and marked "Reserved."

With regard to the proposal to amend § 25.1583 (Proposal 6–56), one commentator recommended the deletion of proposed paragraph (b)(3) concerning powerplant limitations, and paragraph (i) concerning maneuvering load factors. The commentator stated that if the engine instrument markings have to be changed, it should be handled by a service bulletin. The FAA does not agree. The relation between the powerplant limitations and the instrument markings should be explained in the Manual. The commentator also stated that the load factor (number) is meaningless to the pilot as he cannot determine what it is during a pull-up maneuver. He stated that correlation with bank angle is acceptable, but that transport aircraft do not exceed 60 degree bank angles. The FAA believes that the maneuvering load factor should be retained in the Flight Manual because it is established as an operating limitation under § 25.1531, and the correlation with bank angle provides useful information to the pilot concerning the strength limitations of the airplane.

The proposals to amend §§ 23.1583, 25.1583, 27.1583 and 29.1583 are adopted with the revision discussed above.

For consistency in the terminology used in the cooling tests requirements, a nonsubstantive change is being made to §§ 23.1043(a)(1), 23.1043(d), 27.1043(a)(1), 27.1043(d), 29.1043(a)(1), and 29.1043(d) by deleting the words "maximum anticipated air temperature" and inserting in their place the words "maximum ambient atmospheric temperature".

Proposal 6–24. One commentator objected to proposed § 23.1523, which concerns the establishment of the minimum flight crew, stating that it is not necessary to make all aircraft conform to the requirements of Part 25. The FAA believes that proposed § 23.1523 specifies the appropriate requirement that should be considered in determining the minimum flight crew for Part 23 airplanes.

Another commentator said that specification of minimum crew is an operational item that may vary with the type of operation, e.g., for compensation or hire which by law must be conducted in accordance with the highest standards. He concluded that rules specifying the number of crew members for specific operations should be in the operating regulations. The FAA agrees that certain rules concerning the number of crew members properly belong in the operating rules, and this is done, for example, in Subpart M of Part 121. However, under current § 23.1523, the minimum crew is established for VFR only, without requiring consideration of the additional crew duties that arise when IFR operations are authorized. These duties may be imposed by the design and operating characteristics of the aircraft and by its installed equipment. The FAA believes that they must therefore be evaluated during the type-certification process. The proposal to revise § 23.1523 is adopted without substantive change.

Proposal 6–25. One commentator objected to proposed § 23.1541 concerning placards in airplanes of 6,000 pounds or less maximum weight for reasons stated in his comments on Proposal 6–3 concerning Flight Manuals. For a discussion of these comments, see Proposal 6–3. Proposed § 23.1541 is adopted without substantive change.

Proposal 6–26. One commentator objected to proposed § 23.1559 concerning placards in airplanes of 6,000 pounds or less maximum weight for reasons stated in his comments on Proposal 6–3 concerning Flight Manuals. For a discussion of those comments, see Proposal 6–3. Proposed § 23.1559 is adopted without substantive change.

Proposal 6–27. Proposed § 23.1567(b)(2) would require that utility category airplanes that do not meet the spin requirements for acrobatic category airplanes have a placard in clear view of the pilot stating "Spins prohibited." One commentator said that the proposal is redundant and would add to the already confusing proliferation of cockpit placards. The FAA does not agree since the proposal would prevent any possible confusion as to whether a particular utility category airplane has been approved for spins. The proposal is adopted without substantive change.

Proposals 6–28, 2–39, 2–43, and 2–45. Proposed § 23.1581(a) is revised in accordance with the discussion of the proposal to amend § 25.1581 (Proposal 6–55). For another comment related to Proposal 6–28, see Proposal 6–3.

Disposition of Proposal 2–39 to add a new § 23.1353(f) (Notice 75–10) was deferred so that it could be considered in connection with Proposal 6–28. For comments related to proposed § 23.1353(f) and for an explanation of the revision to proposed § 23.1353(f), see the discussion of Proposal 2–87 under Proposal 6–57. Disposition of Proposal 2–45 to revise § 23.1581(b) and to add a new § 23.1581(d) (Notice 75–10) was deferred so that it could be considered in connection with Proposal 6–28.

One commentator, who agreed in general with proposed § 23.1581(b), recommended several clarifications. He indicated that the title "Pilot's Operating Handbook" should be allowed as an alternative to "Airplane Flight Manual." The FAA has no objection to the title "Pilot's Operating Handbook" if the title page also includes a statement indicating that the document is an FAA-required Airplane or Rotorcraft Flight Manual.

The commentator also indicated that the FAA should delete any requirement for individual page approval for operating limitations in Handbooks that meet a specification acceptable to the Administrator. Proposed § 23.1581(b)(1) would require approval of each page containing the prescribed operating limitations whereas current § 23.1581(b) requires that each part of the Airplane Flight Manual containing information presented in §§ 23.1583 through 23.1589 be approved.

The intent of proposed §§ 23.1581(b)(1) and (b)(2) was to require that the presentation of operating limitations be approved by the FAA and be clearly identified as such while at the same time providing an option for the presentation of the other required information. This option would have provided that each page containing the information prescribed in §§ 23.1585 through 23.1589 had to be determined in accordance with the applicable requirements of this part and had to be approved or the information presented in its entirety in a manner acceptable to the Administrator.

In light of the comments received and after further review, the FAA believes that this intent will be accomplished in a simpler manner, and will be more consistent with Parts 25, 27, and 29 flight manual requirements, by retaining the current requirements and providing an alternative to the current requirements in a separate paragraph which provides that each part containing operating limitations must be approved and limited to such information, and the information prescribed in §§ 23.1585 through 23.1589 must be determined in accordance with the applicable requirements of this part and presented in a manner acceptable to the Administrator. Proposed §§ 23.1581(b)(1) and (b)(2) are revised to reflect the changes discussed above.

The references in proposed §§ 23.1581(b)(1) and (b)(2) to the information prescribed in §§ 23.1581(c) (paragraph (a)(2) as adopted) have been deleted to be consistent with the flight manual requirements of Parts 25, 27, and 29.

One commentator objected to Proposal 2-45 on the grounds that procedures, performance data, and loading information for any airplane certificated under Part 23 would not have to be approved by the FAA. This comment evidently refers to proposed § 23.1581(b)(2)(i) (which is incorporated into paragraph (b)(2) as adopted), under which the information prescribed in §§ 23.1585 through 23.1589 would not be identified as FAA-approved, if this information in its entirety is presented in a manner acceptable to the Administrator. The FAA does not agree with the comment. Under the proposal, the information would have to be determined in accordance with the applicable requirements of Part 23. In finding that a manual is acceptable, the FAA would review the manual to determine that the required information is complete and accurate. The manual would also be reviewed to ensure that any additional information provided by the applicant is not in conflict with required information or contrary to the applicable airworthiness requirements. The FAA believes that § 23.1581(b)(2) will provide an adequate method of review of the information prescribed in §§ 23.1585 through 23.1589.

The proposals to amend § 23.1581 are adopted with the revisions discussed above.

Disposition of Proposal 2-43 to amend § 23.1555 (Notice 75-10) was deferred so that it could be considered in connection with Proposal 6-28. No unfavorable comments were received on Proposal 2-43, however, proposed § 23.1555(c)(3) is revised by deleting the words "and in the Airplane Flight Manual" in view of the requirements of §§ 23.1581 and 23.1587(a)(2), as adopted.

Proposal 6-29. For comments related to the proposal to revise § 23.1583(b), see Proposal 6-23.

Proposal 6-30. One commentator objected to the application of proposed § 23.1585, concerning operating procedures, to airplanes of 6,000 pounds or less maximum weight for reasons stated in his comments on Proposal 6-3 concerning Flight Manuals. For a discussion of these comments, see Proposal 6-3.

The proposal to amend § 23.1585 is adopted without substantive change.

[For discussion concerning new § 23.1585(e), see Proposals 6-57 and 2-87.]

Proposals 6-31 and 2-46. One commentator objected to the application of proposed § 23.1587, concerning performance information, to airplanes of 6,000 pounds or less maximum weight for reasons stated in his comments on Proposal 6-3 concerning Flight Manuals. For a discussion of these comments, see Proposal 6-3.

Another commentator stated, in response to proposed § 23.1587(a)(7), which would require information on the steady rate or gradient of climb, that if gradient data are presented, conversion charts should be included, and that ideally each determination should be available; however, he concluded that the option of one or the other should be deleted and a definite requirement adopted. The commentator misinterpreted the proposed requirement. Section 23.65(c), as adopted by this amendment, requires the determination of a gradient of climb for turbine engine powered airplanes. Proposed § 23.1587(a)(7) is worded so as to take into account the requirement of § 23.65(c), not to provide an option for the applicant, i.e., whether gradient of climb or rate of climb is furnished under § 23.1587(a)(7) will be determined by the applicable requirement of §§ 23.65 and 23.77.

Section 23.1587 is adopted as proposed, except that a new § 23.1587(a)(9) has been added to include information on the maximum ambient temperature at which compliance with the cooling requirements is shown for reciprocating engines. This addition is explained in the discussion of the comments on Proposal 6-23.

Disposition of Proposal 2-46 (Notice 75-10), which proposed to delete the second sentence of present § 23.1587(a)(2), was deferred so it could be considered with Proposal 6-31. No unfavorable comments were received on Proposal 2-46. Proposal 2-46 was reproposed in Proposal 6-31, and is adopted without substantive change with the adoption of Proposal 6-31.

Proposal 6-32. Proposed new § 25.21(f) would require that when surface winds must be considered, the wind velocity must be measured at or corrected to a height of 10 meters above the surface, because the National Weather Service is standardizing on a height of 10 meters for reporting winds at airports. One commentator said that since the purpose of the proposal is standardization of Airplane Flight Manual performance information with respect to reported winds for takeoff or landing in service operations, the requirement should be placed in the flight manual requirements under § 25.1587(c)(1)(i) instead of in § 25.21. The FAA agrees that this is one purpose of the proposal but there are flight requirements other than those concerning performance information that require consideration of surface winds. Therefore, the FAA believes that it is more appropriate to include the proposed requirement in § 25.21. However, proposed § 25.21(f) is revised to clarify its applicability.

The proposed change to § 25.21(d), which deals with tolerances for variables in flight testing, would delete the requirement that the tolerance on wind during takeoff and landing tests must be based on the wind measured at a height of 6 feet above the runway. The commentator said that performance analysis is usually based on winds at the height of the mean aerodynamic center of the airplane above the runway surface, and that the data in the Airplane Flight Manual is then corrected to the currently used height of 50 feet. The commentator recommended that this procedure be continued, except that the wind velocities in the Flight Manual should be based on a height of 10 meters instead of 50 feet. The FAA believes that the proposed deletion of the 6-foot height from § 25.21(d), together with proposed § 25.21(f), as revised, would allow continued use of the procedure recommended by the applicant.

The commentator also suggested that the correction chart in Civil Aeronautics Manual 4b Appendix A, Figure 2, be considered for inclusion in Part 25. The FAA does not believe that it is necessary to include this information in the rules.

The proposal to amend § 25.21 is adopted with the revisions discussed above.

Proposal 6-33. For comments related to the proposal to amend § 25.29, see Proposal 6-5.

Proposal 6-34. Several commentators objected to the method of computing V_1 (takeoff decision speed) in proposed § 25.107(a) on the grounds that—(1) the speed increment between V_{EF} (engine failure speed) and V_1 should not be determined with all engines operating because the accelerate-stop distance determined under proposed § 25.109(a) would then be unnecessarily large for the critical engine failure condition (especially for twin-engine airplanes); and (2) placing the 2.0-second time delay between V_{EF} and V_1 in proposed § 25.107(a)(2)(ii) does not adequately provide for these instances in which the pilot may have to analyze and react to an event that occurs immediately before reaching V_1.

It was recommended that proposed § 25.107(a) be revised so that V_1 is determined by adding to V_{EF} the speed gained with the critical engine inoperative during the time interval between the instant at which the critical engine is failed and the instant at which the test pilot recognizes and reacts to the engine failure, as indicated by the pilot's application of the first retarding means during accelerate-stop tests (the 2.0-second minimum time delay that was proposed to be included between V_{EF} and V_1 would be deleted). It was further recommended that proposed § 25.109(a) be revised so that a 2.0-second time delay following V_1 is incorporated into the determination of accelerate-stop distances, as follows: (1) for the engine failure case, the acceleration of the airplane from V_{EF} would be with the critical engine inoperative and would continue for 2.0 seconds after reaching V_1; and (2) for the other event case, the acceleration of the airplans would be with all engines operating and would continue for 2.0 seconds after reaching V_1.

After considering all of the comments on these proposals and after further review, the FAA agrees with these comments and the recommendations. The FAA believes that the recommended revisions would provide for events other than engine failure, even though the speed increment between V_{EF} and V_1 would be determined with the critical engine inoperative instead of all engines operating, because the accelerate-stop distance for the other event case would be determined with all engines operating from the start of takeoff until 2.0 seconds after V_1 is reached. Further, the FAA believes that deleting the 2.0 second minimum time delay from the determination of V_1 and inserting a 2.0-second delay after V_1 in the determination of the accelerate-stop distance would be more appropriate for most rejected takeoff situations, since stopping requires a positive decision and action by the pilot. Proposed §§ 25.107(a) and 25.109(a) are revised accordingly.

Several commentators objected to the 2.0-second (minimum) time delay used in computing V_1 under proposed § 25.107(a)(2)(ii) on the grounds that it would increase the required take-off runway lengths, particularly in the engine failure case, and that such increases are not justified. One commentator recommended that the time delay be reduced to 1.0 second. The revisions discussed above significantly reduce the effect of the 2.0-second time delay on the required accelerate-stop distance in the engine failure case. Under § 25.107(a) as proposed, the airplane would be accelerated to a V_1 speed equal to V_{EF} (engine failure speed) plus the speed gained with all engines operating during a total time interval of about 3 seconds (i.e., during the time required for the test pilot to recognize and react to an engine failure in accelerate-stop tests, plus a 2.0-second time delay for service operations). Under proposed § 25.109(a), the accelerate-stop distance for the engine failure case would be determined by accelerating the airplane from V_{EF} to the V_1 speed determined under proposed § 25.107(a), but with the critical engine inoperative instead of with all engines operating. As pointed out by one of the commentators, the total time interval between engine failure and application of the first retarding means could then become about 6 seconds for a twin-engine airplane in the engine failure case, and the distance traversed during the additional 3 seconds (beyond the time interval prescribed in § 25.107(a) would be included in the accelerate-stop distance. However, under the revisions incorporated in §§ 25.107(a) and 25.109(a) as adopted, the revised V_1 speed is equal to V_{EF} plus the speed gained with the critical engine inoperative during the test pilot's recognition-reaction time interval with no further time delay. The accelerate-stop distance for the engine failure case is then determined by accelerating the airplane with one engine inoperative from V_{EF} to the revised V_1 speed and then for an additional 2.0 seconds, before the first retarding means is applied. Under these revisions, a 2.0-second allowance for time delays in service operation is retained, but the total time interval between V_{EF} and application of the first retarding means in the engine failure case would be significantly reduced (for example the reduction could be from about 6 seconds to about 3 seconds for a twin engine airplane). The accelerate-stop distance for the engine failure case would be reduced accordingly. The FAA does not believe that any further revision is warranted because the 2.0-second delay (incorporated into § 25.109 as adopted rather than § 25.107) is necessary to allow for a surprise element and other operational factors not covered in accelerate-stop tests.

One commentator proposed that V_1 speeds be established as recognition speeds for both engine failure and other event cases. However, it is not clear how a recognition time for "other events" would be determined since there is a large variety of possible events that could lead to a rejected takeoff.

Another commentator, in addition to suggesting changes similar to those already made as discussed above, recommended that V_1 be established as a failure recognition speed which would be determined by adding to the speed at which the initial failure is assumed to occur, the time between the failure and the pilot's recognition of the failure (assumed to be 2.0 seconds before his reaction to the failure), and the time not less than 2.0 seconds, to allow for time delays in service under reasonably unfavorable operating conditions. The FAA does not agree that there should be a 2.0-second minimum delay, regardless of the pilot's actual reaction time, in determining V_1 under § 25.107(a), because proposed § 25.109(a) as revised will require that the accelerate-stop distance computations include acceleration of the airplane for 2.0 seconds after V_1 is reached.

This commentator further proposed that closing of the throttles be specified in proposed § 25.109 as the first action to be taken in stopping the airplane, with subsequent actions at intervals of not less than one second. Current § 25.101(h) already requires that the procedures used in determining the accelerate-stop distance must be able to be consistently executed in service by crews of average skill, and must include allowance for any time delays in the execution of the procedures that may be reasonably expected in service. The order in which the retarding devices are applied and the subsequent time delays will be established during type certification under the general provisions of § 25.101(h).

One commentator objected to the requirement in proposed § 25.107(a) that V_{EF} may not be less than V_{MCG} (minimum control speed on the ground) determined under (proposed) § 25.149(e). The commentator stated that it should only be required that V_1 not be less than V_{MCG} because if an engine failure is recognized between V_{EF} and V_1 the takeoff should be aborted. However, under proposed §§ 25.107(a) and 25.109(a), as revised V_1 will be placed at the speed at which the test pilot recognizes and reacts to an engine failure during accelerate-stop tests and the 2.0-second time delay will be inserted after V_1 instead of between V_{EF} and V_1 as proposed. This revision allows V_1 to be very close to V_{EF}. Therefore, the effect on takeoff and accelerate-stop distances of requiring that V_{EF} not be less than V_{MCG} has been significantly reduced because of the deletion of the minimum 2.0-second delay between V_{EF} and V_1. In addition, the FAA believes that V_{EF} should not be less than V_{MCG} so that there will be at least a small margin between V_{MCG} and V_1 to ensure controllability of the airplane at V_1.

One commentator recommended that the proposals containing V_1 and accelerate-stop distances be made retroactive to existing transport category airplanes one year after the date of their adoption. Current § 25.101(h) already provides that the procedures used in determining accelerate-stop distances include allowance for time delays reasonably expected in service. The purpose of the present proposals is to clarify and standardize the method of including an appropriate time delay in the accelerate-stop performance determination for airplanes type certificated in the future.

In regard to proposal 6-2, which would change the definition of V_1 in § 1.2 from "critical engine failure speed" to "takeoff decision speed," one commentator considered the proposed definition to be inadequate because "decision" is an undefined quantity. The commentator recommended that the proposal be revised to state that V_1 means the speed at which the flight crew has recognized an engine failure or other event and takes action either to reject or continue the takeoff. The significance of V_1 with respect to accelerate-stop distance, takeoff distance, and the related operating procedures is explained in the Airplane Flight Manual and the FAA believes it is too complex to be completely described in a brief definition in § 1.2. Accordingly, the proposed amendment of § 1.2 is adopted without substantive change.

The proposals to revise §§ 25.107(a) and 25.109(a) are adopted with the revisions discussed above.

Proposal 6–35. One commentator stated that if the intent of proposed §§ 25.107(d) and (e)(1)(iv) with respect to the engine-out V_{MU} is to ensure controllability, the V_R–5 tests required by § 25.107(e)(3) should be expanded to require the test over the full range of certification conditions and all references to one-engine-inoperative V_{MU} should be deleted from §§ 25.107(d) and (e). The FAA does not agree with this recommendation because it would ignore the performance aspects (thrust-to-weight ratio) of the one-engine-inoperative V_{MU} demonstration.

Another commentator stated that flight test experience has shown that trim and control drag is accounted for with the thrust/weight ratio corresponding to the one-engine-inoperative condition used in the test, and that actual engine-out V_{MU} tests result in the same V_{MU} as tests conducted at the simulated engine-out thrust-to-weight ratio. The FAA agrees, and the last sentence of proposed § 25.107(e)(iv) is deleted. The proposal to amend § 25.107 is adopted with the revision discussed above.

Proposal 6–36 . For comments related to proposed § 25.109(a), see Proposal 6–34.

Proposal 6–37. One commentator agreed with the proposed change to § 25.111(a)(2), which would delete the reference to V_1 and substitute V_{EF} in its place to make § 25.111(a) consistent with proposed § 25.107(a) (Proposal 6–34). However, this commentator did not agree with making the same change to § 25.111(a)(3), and said that the present reference to V_1 in that paragraph is correct for the new definition of V_1 (i.e., as defined in proposed §§ 1.2 and 25.107(a)). The FAA does not agree with the comment on proposed § 25.111(a)(3) because it would leave a gap in the requirements for the speed range between V_{EF} and V_1.

Accordingly, the proposal to amend §§ 25.111(a)(2) and (a)(3) is adopted without substantive change.

Proposal 6–38. Proposed § 25.121(e) would require the determination of the vertical distance required to make a transition from a 3-degree descent path in the landing configuration with the critical engine inoperative to a stabilized climb condition. Several commentators stated that the vertical distance determined in this manner should not be considered a minimum decision height for approaches. The FAA agrees, since the establishment of decision height requires consideration of many operational factors. Some commentators stated that the landing configuration in the proposal is not appropriate for one-engine-inoperative approaches. One commentator recommended that the horizontal as well as the vertical distance for transition to approach climb be determined, and referred to the work of the ICAO Obstacle Clearance Panel on this subject. Another commentator recommended that the required determination take into account the minimum control speed, V_{MC}. In light of the comments received, and after further review, the FAA believes that proposal 6–38 should be withdrawn.

Proposal 6–39. Several commentators objected to the proposal to amend § 25.123(a) on the ground that current § 25.123(a) is conservative and has the advantage of greater simplicity. The FAA agrees and the proposal to amend § 25.123(a) is therefore withdrawn.

Proposal 6–40. One commentator recommended that proposed § 25.143(b) be withdrawn and that current § 25.143(b) be retained on the ground that there are areas within the flight envelope from takeoff to landing where the failure of a second engine cannot be handled smoothly and safely. The commentator also stated that the proposed amendment is vague and could produce confusion with respect to time between failures, and that it could be interpreted to require a combination of double engine failure and configuration changes. The FAA agrees that the proposed rule requires some clarification, but does not believe that the current § 25.143(b) should be retained. With respect to failure of a second engine on airplanes with three or more engines, the FAA believes that failure of a second engine can be reasonably expected in the enroute, approach, and landing stages of flight after failure of one engine earlier in the flight.

Therefore, proposed § 25.143(b) is revised to require consideration of the sudden failure of the second critical engine when the airplane is in a trimmed condition with one engine inoperative in the enroute, approach, and landing configurations. This revision also clarifies the requirement with respect to time between engine failures by providing that the airplane is in a trimmed condition with one engine inoperative when the second engine is failed. In regard to combination of engine failure and configuration changes, it should be noted that the introductory sentence of proposed § 25.143(b) refers to "probable operating conditions," and that some change of configuration may be desirable after engine failure, e.g., retracting the landing gear for a go-around after engine failure in the landing configuration.

Another commentator considered the proposed configuration change requirement to be too general and vague and suggested that the proposed requirement contain certain specific criteria. The commentator also recommended that interpretative material be included in the rule or in the associated Flight Test Guide. The FAA does not agree. The FAA believes that the wording of the proposed rule is clear and would accomplish the intended purpose.

The proposal to amend § 25.143(b) is adopted with the revision discussed above.

No unfavorable comments were received on the proposal to amend § 25.143(c), which would reduce the maximum allowable rudder force for temporary application in meeting the controllability requirements, from 180 pounds to 150 pounds. Accordingly, the proposal is adopted without substantive change. For consistency with § 25.143(c), as adopted, and since flight test experience has shown that 180 pounds may make control difficult for some pilots under some flight conditions, § 25.147(a) is amended by deleting the reference to "180 pounds" and inserting in its place "150 pounds".

Proposal 6-41. One commentator recommended deletion of proposed § 25.149(a), which would require that the method used to simulate critical engine failure must represent the modes of powerplant failure expected in service. The FAA does not agree. This provision is necessary to ensure that the most adverse condition with respect to controllability is considered. To clarify this intent, § 25.149(a) is revised to require consideration of the most critical mode of powerplant failure with respect to controllability expected in service. This commentator objected specifically to dynamic engine cut demonstrations because of the hazards involved. The FAA believes that dynamic effects should be considered during type certification, since they might occur in service operations.

Upon further review, the FAA believes that specific guidance as to the setting of the propeller on propeller-driven airplanes is necessary with regard to proposed § 25.149(c). Current § 25.149(b)(8) specifies the setting of the propeller for reciprocating engine-powered airplanes. Current § 25.149(c)(5) specifies that for turbine engine-powered airplanes, the airplane must be ". . . in the most critical takeoff configuration existing along the flight path . . ." and has been administered to require that the setting of the propeller of turbine engine-powered, propeller-driven airplanes be the same as that specified in current § 25.149(b)(8). Accordingly, current § 25.149(b)(8) is retained and redesignated § 25.149(c)(7), to be applicable to all propeller-driven airplanes.

One commentator stated that the pilot should be provided with information regarding the effects of bank angle on V_{MC}. The FAA does not have enough information at this time to justify the suggested requirement.

Proposed § 25.149(e) would require the determination of a minimum control speed on the ground, V_{MCG}, for use in establishing takeoff speeds under proposed § 25.107 (see Proposal 6-34). One commentator recommended that the second sentence of proposed § 25.149(e) be revised to read "During this demonstration, the permissible lateral deviation of the path of the airplane would be limited to 30 feet." He said that the revision would eliminate the possibility of misinterpretation. The FAA believes that the language of the proposal is clear; however, it may be too restrictive in requiring the ground track to be parallel to or converging toward the centerline of the runway when the airplane is rotated for takeoff, and thereby unnecessarily delay rotation in determining takeoff performance under §§ 25.107(e) and 25.111. Section 25.149(e) is therefore revised to state that the airplane's path, from the point at which the critical engine is made inoperative to the point at which recovery to a direction parallel to the runway centerline is completed, may not deviate more than 30 feet laterally from the centerline. The adopted rule would allow the airplane to be rotated for takeoff before recovery to a direction parallel to the runway centerline is completed; however, it should be noted that it requires that V_{MCG} must be determined to enable the takeoff to be safely continued using normal piloting skill. The commentator also recommended that proposed §§ 25.149(e)(3) and (e)(5) be deleted because flight tests have proven that gross weight and center of gravity have no effect on V_{MCG}. The FAA does not agree. The airplane's acceleration varies with its weight, and this may affect directional control and lateral deviation. The center-of-gravity location may also affect directional stability and control on the ground.

One commentator stated that proposed § 25.149(e) would allow a lateral deviation of 30 feet during the determination of V_{MCG}, whereas the current FAA Flight Test Handbook recommends 25 feet and the Air Force requires 25 feet. The commentator recommended that 25 feet be specified in the adopted rule. The FAA believes that the 30-foot deviation limit will assist in international standardization in this area. In addition it should be noted that § 25.107(a)(1) as adopted (see discussion of Proposal 6–34) requires V_{EF} to be not less than V_{MCG} and V_1 to be greater than V_{EF}, thus providing a small controllability margin at V_1.

Several commentators recommended that the proposal be revised to allow the use of nose wheel steering in the determination of V_{MCG} under § 25.149(e), if control is through the rudder pedals and the demonstration is made on a wet runway. The FAA does not agree. The effectiveness of nose wheel steering depends to a large degree on runway friction characteristics and the load on the nose wheel. Certification tests on a wet runway would not cover the more extreme slippery runway conditions or all possible variations in takeoff conditions and techniques likely to occur in service. The FAA therefore believes that V_{MCG} should be determined without the use of nose wheel steering, as stated in proposed § 25.149(e).

In regard to the airplane configuration used in determining V_{MCG}, one commentator recommended that proposed § 25.149(e)(1) be revised to specify each takeoff configuration instead of the most critical takeoff configuration, to allow a separate V_{MCG} for different flap settings. The FAA agrees that an applicant should be allowed to determine a separate V_{MCG} for different takeoff configurations but believes that the applicant should also have the option of determining a V_{MCG} value for only the most critical takeoff configuration. Proposed § 25.149(e)(1) is revised accordingly.

Proposed § 25.149(e)(2) would require that V_{MCG} be determined with maximum permissible takeoff power or thrust on the operating engines; however, the word "permissible," in relation to power or thrust, is not defined or used elsewhere in the performance and flight characteristics requirements. For consistency with §§ 25.101(c) and 25.149(c)(1), the word "permissible" is replaced by "available" in § 25.149(e)(2) as adopted. It should be noted that § 25.101(c) refers to the propulsive thrust available under the particular flight condition and thus provides for any difference between the takeoff thrust set during takeoff and the thrust available in flight for a go-around.

Proposed §§ 25.149(f), (g), and (h) would require the determination of two new minimum control speeds, V_{MCL} and V_{MCL-2}, associated with an engine failure during landing approaches that are initiated with all engines operating and with one engine inoperative, respectively. One commentator said that these proposals are inconsistent with the V_{MCL} definitions being considered in the development of wet runway landing performance rules. The commentator recommended that these proposals be deleted until an acceptable rational landing rule is established. Another commentator stated that V_{MCL} and V_{MCL-2} would serve no useful purpose and may confuse flight crews. The FAA does not agree with these comments. These proposals are intended to cover the controllability aspects of an engine failure during landing approach. Proposed § 25.149(f) as revised is intended to determine a minimum control speed for the situation where an engine fails after power or thrust has been increased to make a go-around from an approach with all engines operating. For airplanes with three or more engines, proposed §§ 25.149 (g) and (h) as revised are intended to determine a minimum speed for maintaining safe control during the power or thrust changes that are likely to be made following the failure of a second engine during an approach initiated with one engine inoperative. The FAA believes that these proposals, with revisions discussed, should be adopted at this time to provide information for use in pilot training and service operations.

One commentator noted that proposed §§ 25.149(f)(5), (g)(5), and (h)(2) specify "maximum permissible power" in the determination of V_{MCL} and V_{MCL-2}. The commentator recommended that this be changed to "takeoff or maximum permissible power" as used in present § 25.149. Another commentator said that it is not clear whether "maximum permissible thrust" in proposed §§ 25.149(f), (g), and (h) means maximum takeoff (or contingency) thrust, or whether a lower thrust can be scheduled. This commentator also stated that takeoff (or contingency) thrust would represent an increase in severity with respect to both the British Civil Air Regulations and present § 25.149(d), and that the thrust to be associated with recovering control following a sudden engine failure in §§ 25.149(f) and (g) should be the power required for a 3-degree approach, and the thrust range to be associated with maintaining straight flight thereafter should be from minimum power to power for level flight or maximum power, whichever occurs first.

As explained in the preceding discussion of § 25.149(e)(2), current § 25.149(c)(1) uses the words "maximum available takeoff power or thrust". The FAA believes that, for V_{MCL}, the power or thrust condition at the time of engine failure should be the thrust associated with a go-around and therefore believes that maximum available takeoff power or thrust should be prescribed in § 25.149(f) since the approach climb requirements in § 25.121(d) allow use of available takeoff power or thrust. Proposed § 25.149(f) is revised accordingly.

However, since there are no performance requirements for a go-around with two engines inoperative, the FAA believes that the initial power condition at the time of failure of the second engine in § 25.149(g) for V_{MCL-2} should be that for a 3-degree approach with one engine inoperative. This is one of the initial power conditions prescribed in proposed § 25.149(h). In regard to the maximum power or thrust to be applied after the second engine is made inoperative, the FAA believes that the value of V_{MCL-2} to be furnished as information to the pilot should be based on the power or thrust that provides the maximum performance capability of the airplane without exceeding the powerplant limitations, i.e., maximum available takeoff power or thrust at the upper end of the range, and minimum available power or thrust at the lower end of the range. Proposed § 25.149(g) is revised accordingly.

Since V_{MCL} will be determined with maximum available takeoff power, proposed § 25.149(h) is revised so that the requirement of changing the power or the operating engines after failure of the critical engine only applies to V_{MCL-2}.

One commentator said that the critical weight for V_{MCL} can be the lowest weight, when a 5-degree bank angle is used, and he therefore recommended that proposed §§ 25.149(f)(4) and (g)(4) be revised to specify the most unfavorable weight in the range of landing weights, instead of the maximum sea level landing weight (or any lesser weight necessary to show V_{MCL}). The FAA agrees that light weight may be critical for V_{MCL} or V_{MCL-2} but does not believe that the recommended wording change is necessary. The proposal is consistent with current § 25.149(c)(4), and light weight conditions are considered under the current rule.

One commentator stated that the proposal requires determination of V_{MCL} and V_{MCL-2} but does not appear to require that this information be made available to flight crews or that it be used in determining the approach speed. The commentator recommended that the proposal be changed to require that V_{MCL} and V_{MCL-2} be included in the Airplane Flight Manual and also that the landing performance requirements in § 25.125 be amended to take account of V_{MCL}. The FAA does not have sufficient information to justify changing the landing performance requirements in the manner recommended by the commentator. However, information regarding V_{MCL} and V_{MCL-2} would be required to be furnished in the Airplane Flight Manual pursuant to the provisions of § 25.1585 (a)(1).

For a comment related to the clause "either with zero yaw or with an angle of bank of not more than 5 degrees", which is contained in proposed §§ 25.149(e), 25.149(f), and 25.149(g), see Proposal 6–13.

The proposal to amend § 25.149 is adopted with the revisions discussed above.

Proposal 6–42. One commentator stated that the exception in proposed § 25.177(b)(2) for the speed range from V_{MO}/M_{MO} to V_{FC}/M_{FC} should also be applicable to the speed range from 1.2 V_{S1} to V_{MO}/M_{MO}. The FAA does not agree. V_{MO}/M_{MO} is the maximum operating limit speed. Gradual divergence that is easily recognizable and controllable by the pilot is allowed in the speed range above V_{MO}/M_{MO} because it is expected that operation at speeds above V_{MO}/M_{MO} will occur only for brief periods and that flight control demands will in general be limited to the restoration of flight at speeds below V_{MO}/M_{MO}.

Accordingly, the proposal to revise § 25.177(b) is adopted as proposed except that a provision for maximum flap extended speed and maximum landing gear extended speed has been added for clarification and consistency with the present rule.

Proposal 6–43. Proposed § 25.181(b) would require that combined lateral-directional ("Dutch roll") oscillations be positively damped, i.e., diminish after a disturbance, but it does not specify the degree of damping. One commentator recommended that the proposal be revised to state that lateral-directional oscillations should be damped but that neutral damping or mild divergence would be acceptable if it is easily controllable by the pilot. The commentator said the proposal is unnecessarily restrictive following the failure of a stability augmentation device, since the device must be designed to meet § 25.21(e), and that the damping required should be related to the frequency and amplitude of the oscillation, the pilot tasks, and environmental effects. The commentator also said that, if unsatisfactory damping following a failure is confined to an avoidable flight area or configuration and is controllable to return the aircraft to a satisfactory condition for safe flight, the lack of appreciable positive damping may be acceptable. The FAA does not agree with this recommendation. Current § 25.181 requires any short period oscillation to be heavily damped, and the proposal would require that combined lateral-directional oscillations be positively damped instead of heavily damped. The change recommended by the commentator would increase the pilot's tasks and could result in an unsafe situation when operating in rough air. Section 25.672(c) already allows degradation of stability and other flight characteristics after any single failure in a stability augmentation system if the airplane is safely controllable and the resulting stability characteristics allow continued safe flight and landing.

Another commentator recommended that the proposal should be changed to raise the lower limit of the speed range for positive stability from the stalling speed to 1.2 V_{S1}. The proposal is the same as the current rule with respect to the lower speed limit of the speed range for positive stability and the FAA does not have sufficient information at the present time to justify raising the lower speed limit to 1.2 V_{S1}.

The proposal to revise § 25.181 is adopted without substantive change.

Proposal 6–44. One commentator recommended that the proposal to amend § 25.201 and the proposal to amend § 25.207 (Proposal 6–45) be withdrawn in light of current FAA studies on landing distances which may result in a new stall requirement. The FAA does not agree with this recommendation because the proposals for §§ 25.201 and 25.207 deal with stall demonstration and stall warning, and current studies for the landing distance rules do not include changes to §§ 25.201 and 25.207.

Another commentator stated that many modern airplanes are accepted as having correct stalling characteristics even though these occur before reaching the angle of attack for maximum lift, and suggested that the phrase "at an angle of attack measurably greater than that for maximum lift" be deleted from proposed § 25.201(d)(1). Proposed § 25.201(d)(2) sets forth an exception to the requirements of proposed § 25.201 (d)(1) (this would be a relaxation of the requirement in current § 25.201(c)(2) with respect to those instances in which the airplane may be considered to be stalled). The FAA does not believe any further relaxation would be justified.

One commentator expressed concern that proposed § 25.201 might result in unwarranted increases in operational speeds and runway length requirements; however, no explanation of this comment was provided. Some operating speeds are affected by stalling speeds which are determined under §§ 25.103, 25.203, and 25.201. Proposed § 25.201 (d)(2) provides that for an airplane demonstrating an unmistakable inherent aerodynamic warning in a particular configuration of a magnitude and severity that is a strong and effective deterrent to further speed reduction, the airplane may be considered stalled when it reaches the speed at which the effective deterrent is clearly manifested. (This exception is present in the current rule but is only applicable to those airplanes demonstrating the required degree of warning in all required configurations.) The FAA believes that it is necessary that an applicant be allowed to limit the stall demonstration to the speed where a strong and effective deterrent (such as severe buffeting) is clearly manifested because operation of the airplane at any lower airspeed may be hazardous. Therefore, the FAA believes that any increase in an operating airspeed because a stall demonstration was limited to the airspeed at which there exists an effective deterrent, as provided in proposed § 25.201(d)(2), is justified.

Accordingly, the proposal to amend § 25.201 is adopted as proposed, except that a nonsubstantive change is made to proposed § 25.201(d)(2) to clarify its intent. The proposal to amend § 25.207 is adopted without substantive change.

Proposal 6–45. For comments related to the proposal to amend § 25.207, see Proposal 6–44.

Proposal 6–46. Proposed § 25.233(a) would change the requirements concerning ground looping tendency in cross winds by substituting "25 knots" in place of "0.2 V_{so}" for the prescribed wind velocity. Several commentators objected to the use of 25 knots for the required wind velocity, stating that the present requirement corresponds to about 20 knots for most airplanes, and that standardizing on a height of 10 meters above the surface for airport wind velocities (see Proposal 6–32 for § 25.21(f)) would also increase the required cross wind component (as compared with the present practice of correcting wind velocity to a height of 50 feet). The FAA agrees that 20 knots would be an appropriate minimum value for the cross wind component; however, this would be less severe than the present rule for airplanes with a stalling speed (V_{so}) greater than 100 knots. Therefore, § 25.233(a) is revised to replace "0.2 V_{s}" with "20 knots or 0.2 V_{so}, whichever is greater, except that the wind velocity need not exceed 25 knots".

One commentator suggested that the rule be written to allow the use of analysis to show acceptable ground handling characteristics for cross wind components greater than 20 knots. The FAA does not agree that analytic methods are reliable for this purpose. (See discussion of Proposal 6–47.)

Proposal 6–47. Proposed § 25.237(a)(1) would establish 25 knots as the minimum cross wind component for landplanes, to be demonstrated on dry runways. Several commentators objected to the use of 25 knots for the required minimum wind velocity. For reasons explained in the discussion of Proposal 6–46, proposed §§ 25.237(a) and (b) are revised, consistent with § 25.233 as adopted, by replacing "25 knots" with "20 knots or 0.2 V_{so}, whichever is greater, except that it need not exceed 25 knots."

Proposed § 25.237(a)(2) would require that a safe cross wind component be established for wet runways, but would allow this to be determined by analysis in lieu of demonstration. Two commentators recommended that the proposal concerning wet runways be deleted, since there is no definition of "wet," and they considered the current rules for cross wind operation to be adequate for either wet or dry cases. Two other commentators doubted the validity of analytic methods for establishing a safe cross wind component for wet runways. In light of the comments received, and after further review, the FAA believes that proposed § 25.237(a)(2) is premature and it is withdrawn.

Proposal 6–48. Two commentators recommended that proposed § 25.251(e) be revised to prescribe an acceleration of ±0.1 g, instead of ±0.05 g, in defining the onset of buffet. One of the commentators stated that this change would ensure a level of buffet that would be distinguishable under turbulent air conditions. The commentator stated that contrary to the explanation in the notice, test pilots have signified the onset of buffet when the buffet level at a flight station was greater than ±0.1 g, and that defining buffet onset in § 25.251(e) as ±0.05 g would unnecessarily limit the altitude-payload capability of the airplane. After considering the comments received, and after further review, the FAA does not believe it has enough information at this time to specify an acceleration value for the onset of perceptible buffeting which would be applicable to all airplanes. Accordingly, the proposal is withdrawn.

Proposal 6–49. Proposed new § 25.255 would establish requirements for maneuvering and dive recovery characteristics with the airplane out of trim by the amount resulting from a three-second movement of the primary longitudinal trim system at its normal rate with no aerodynamic load, or the maximum mistrim that can be sustained by the autopilot while maintaining level flight in the high speed cruising condition, whichever is greater. One commentator said that the requirement would appear not to apply to a manual trim system, and that this should be made clear. The intent of the proposal is to provide a basic maneuvering stability and dive recovery requirement regardless of the type of trim system used in the airplane.

To make this intent clear, the first sentence of the lead-in of proposed § 25.255 is revised by inserting the parenthetic "(or an equivalent degree of trim for airplanes that do not have a power operated trim system)". In addition, current § 25.655(b) requires that if an adjustable stabilizer is used, it must have stops that will limit the range of travel to the maximum for which the airplane is shown to meet the trim requirements of § 25.161. Therefore, the first sentence of the lead-in of proposed § 25.255 is also revised by inserting an exception indicating that the trim movement need not exceed the range established by stops in the trim system, including those required by § 25.655(b) for adjustable stabilizers. It should be noted that the word "primary" in the first sentence of the lead-in of proposed § 25.255 is being deleted since its usage in this context is inappropriate. The same commentator also said that he does not understand the phrase relating to the autopilot, but believes there is a need for an analysis to show whether greater mistrim can result from autopilot or other system malfunction, or from normal autopilot functioning such as when flying on altitude hold through updrafts. The phrase in the proposal relating to autopilots is intended to provide for circumstances in which the trim system is actuated, either by a runaway or by the pilot, while the autopilot is engaged, and the autopilot is then disengaged when the degree of mistrim reaches the point where the autopilot can no longer hold level flight. The FAA believes that this is an appropriate test criterion. In addition, it should be noted that autopilot malfunctions are covered under § 25.1329.

One commentator recommended that the proposed wording "at its normal rate with no aerodynamic load" in the lead-in of proposed § 25.255 be replaced by "at the rate existing for the specified flight condition." The FAA agrees that where the trim system is designed to vary the rate of trim movement according to the flight condition (e.g., as a function of the dynamic pressure), this variation may be taken into account; however, the effects of aerodynamic loads on trim movement may vary in a complex manner, e.g., with center of gravity, airspeed, and system friction. As stated in the notice, the proposal is intended to simulate a typical out-of-trim condition. The FAA believes that the requirement should be specified so that the required trim change can be determined by a relatively simple and uniform procedure. Accordingly, § 25.255 as adopted is revised to specify a three-second movement of the trim system at the normal rate for the particular flight condition with no aerodynamic load.

One commentator recommended that § 25.255(a) be changed to read: "The slope of the stick force vs. g (curve) for load factors between −1g and +2.5g must be positive at speeds up to V_{FC}/M_{FC} or aural warning (speed), except that a 'flattening' of the stick force gradient or a reduction in stick force is permissible if it does not result in the tendency to overcontrol. Lesser acceleration values may be used at altitudes where buffet envelopes are established in accordance with § 25.251(e)." The FAA disagrees with the recommendation. Current § 25.253(b) already allows M_{FC} to be the same as the Mach number at which effective speed warning occurs for altitudes where Mach number is the limiting factor. At lower altitudes where airspeed is the limiting factor, V_{FC} under § 25.253(b) must be higher than the aural warning speed under § 25.1303(c)(1). Recoveries from severe upsets or evasive maneuvers are likely to be made in this altitude range at speeds above the aural warning speed. Threfore, the FAA believes that the proposed requirement should be met at speeds up to V_{FC}/M_{FC}. In addition, to minimize the possibility of over-control and over-stressing the airplane structure, the FAA believes that a reduction in stick force (negative slope of the stick force per g curve) should not be allowed at speeds up to V_{FC}/M_{FC}. However, it should be noted that flattening of the stick force gradient would be allowed under the proposal as long as the slope is positive.

The changes to proposed § 25.255(a) recommended by this commentator include deleting the proposed requirement for the speed range between V_{FC}/M_{FC} and V_{DF}/M_{DF} (the demonstrated flight dive speed). For this speed range, the proposal states that there may not be reversal of the primary longitudinal control force. Speeds above V_{FC}/M_{FC} have been reached during recovery from upsets in severe turbulence. The FAA believes that reversal of the direction of the control force (as shown on the stick force per g diagram) should not be allowed at speeds up to V_{DF}/M_{DF}, because force reversal on the primary control could be confusing to the pilots and contribute to hazardous over-control in severe turbulence.

Proposed § 25.255(a) provides that acceleration values less than those prescribed may be used at altitudes and speeds where buffet envelopes are established in accordance with § 25.251(e). One commentator objected to this provision and suggested that the proposal be revised to state that, at speeds up to V_{FC}/M_{FC}, the stick force curve must have a positive slope, and at speeds up to V_{DF}/M_{DF} there may not be a reversal of the primary longitudinal control force for normal acceleration values between −1 g and the lesser of 2.5 g and a normal acceleration corresponding, in the particular circumstances of weight, altitude, and air speed or Mach number, to buffeting or other phenomena, of such intensity as to be a strong deterrent to further application of primary longitudinal control force. The FAA does not believe that the buffeting criteria suggested by the commentator would be appropriate, since severe buffeting could mask the normal stick force gradient characteristics.

Another commentator suggested that the proposal be revised to state that "where buffet envelopes are established in accordance with § 25.251(e), the corresponding lesser acceleration values may be used." The FAA disagrees with the recommendation. The suggested wording would indicate that the requirement for positive maneuvering stability (stick force per g) is limited to the load factors within the buffet onset envelopes (i.e., perceptible buffeting) determined under § 25.251(e). However, § 25.251(e) also requires that probable inadvertent excursions beyond the boundaries of the buffet onset envelopes may not result in unsafe conditions. The FAA believes that positive maneuvering stability should be required for inadvertent excursions beyond the buffet onset boundaries, since a pilot is likely to exceed these boundaries in recovering from an upset.

Accordingly, § 25.255 is clarified by deleting the specific acceleration (g) values and exception clause in paragraph (a), and by setting forth a revised exception clause in a paragraph (e) which states that the accelerations need not exceed the maneuvering load factors associated with probable inadvertent excursions beyond the boundaries of the buffet onset envelopes determined under § 25.251(e). For consistency with the structural strength requirements, § 25.255(e) as adopted also states that the accelerations need not exceed the limit maneuvering load factors prescribed in §§ 25.333(b) and 25.337.

In addition, the other paragraphs of proposed § 25.255 have been restructured and redesignated for clarity. The second sentence of proposed § 25.255(d) would provide for the use of longitudinal trim to assist in producing the required 1.5 g for recovery. One commentator suggested that a clause be inserted to require that it be possible to produce at least 1.2 g without use of the longitudinal trim system and without exceeding a longitudinal control force of 125 lbs. The FAA believes that the recommended change is unnecessary because proposed § 25.255(d) already provides that longitudinal trim can only be used to assist in producing 1.5 g if it meets certain requirements.

Proposed § 25.255(d) requires that if the longitudinal trim is used to assist in the dive recovery, it must be shown that the trim can be actuated in the nose up direction with the primary surface (e.g., elevators) loaded to produce the least of the nose up control forces specified in paragraphs (d)(1), (d)(2), and (d)(3). One commentator recommended that proposed paragraph (d)(1) be deleted and that paragraph (d)(2) be changed to "125 pounds." The FAA does not agree. In an upset, the initial attempt at recovery is likely to be made with the primary pitch control, and on some airplane designs the airloads on the horizontal tail surfaces tend to prevent movement of the trim system at high speeds. The change recommended by the commentator assumes, in effect, that the pilots will actuate the trim in time to obtain recovery before they apply more than 125 pounds on the primary control. This may not be a valid assumption in extreme upset conditions.

One commentator stated that it is impracticable to demonstrate 1.5 g, and less than 1 g, at V_{DF}/M_{DF} in a flight test without exceeding V_{DF}/M_{DF}, and that some alleviation should be provided to cover this. Proposed § 25.255(d), which states that it must be possible from an overspeed condition at V_{DF}/M_{DF} to produce at least 1.5 g for recovery by applying not more than 125 pounds of control force, would only require that the test be started at V_{DF}/M_{DF}. With regard to accelerations less than 1 g, the commentator has apparently misinterpreted the requirement of proposed § 25.255(f). The intent of the requirement in proposed § 25.255(f) is that the entry speeds for flight test investigations at acceleration values less than 1 g should be limited to the extent necessary to accomplish a recovery without exceeding V_{DF}/M_{DF}. To clarify this intent, proposed § 25.255(f) is revised and incorporated into § 25.255(e).

Another commentator recommended certain changes in the arrangement of paragraphs in § 25.255 along with other changes already discussed above. The FAA believes, however, that the paragraphs of proposed § 25.255, as revised, are in the most appropriate order for clarity.

One commentator stated that proposed § 25.255 should be changed to be consistent with the manner in which the out-of-trim special condition has been applied in certification tests since 1965. The wording of the special conditions for various airplanes, and of related regulations §§ 25.251 and 25.253, has changed between 1965 and the present time. The proposal in the notice is based on the wording of recent special conditions.

Proposal 6–50. Proposed § 25.703 would require a takeoff warning system to warn the pilots during the initial portion of the takeoff roll if the airplane is in a configuration that would prevent successful completion of the takeoff. One commentator recommended that the proposed requirement for both aural and visual warnings be changed to require either an aural or visual warning. Another commentator questioned the desirability of a visual warning, particularly at night, citing the time that may be lost in searching for a visual warning. The FAA agrees with the latter comment. Accordingly, the requirement for an aural warning is retained and the requirement for a visual warning is withdrawn.

One commentator recommended that the words "including any of the following" (configurations) in proposed § 25.703(a) be changed to "consisting of the following" (configurations). The FAA does not agree since a particular airplane design may incorporate some other variable geometry device that would not allow a safe takeoff when in the wrong position.

The same commentator stated that proposed § 25.703(c), which would require that the means used to activate the system function properly throughout the ranges of takeoff weights, altitudes, and temperatures for which certification is requested, is superfluous and should be deleted. The FAA believes that this paragraph should be retained to clearly define the scope of the requirements.

This commentator also recommended deletion of proposed § 25.703(d) which would require that the system be designed to provide reliable sensing of an unsafe position of each critical aerodynamic surface. The commentator stated that such a system would be unworkable, over-sophisticated, and could degrade flight safety through numerous nuisance warnings. He pointed out that critical aerodynamic surfaces would include ailerons, rudder, and spoilers, and that "proper" position of such surfaces during takeoff would be affected by cross winds, engine failure, etc. The FAA agrees that the requirements in proposed § 25.703(d) could result in a warning system so complex that its effectiveness may be impaired. Proposed paragraph (d) is therefore withdrawn.

In regard to proposed § 25.703(b), one commentator recommended that consideration be given to a system cutoff at some significant airspeed, e.g., 100 knots. It was stated that any valid warning would probably have sounded by the time that speed is reached and the cutoff would preclude unwarranted aborts due to warning system malfunction at high speeds. Proposed § 25.703(b) would require the warning to continue until the configuration is changed to allow a safe takeoff, the takeoff roll is terminated, or the warning is manually deactivated by the pilot. The FAA agrees that a system cutoff at high speeds should be permitted, but believes that the cutoff should not be set below the V_1 speed, since the takeoff can be rejected within the established accelerate-stop distance from any speed up to V_1. Since the next speed above V_1 that can be sensed by a simple means is V_R (e.g., by nose gear switches), the FAA believes that deactivation of the takeoff warning system should be allowed when the airplane is rotated for takeoff. Proposed § 25.703 is revised accordingly.

With respect to the requirement in proposed § 25.703(b) that the warning must continue until the takeoff roll is terminated, the intention of the proposal was not to require that the warning must continue until the airplane is brought to a full stop, but that it must continue until action is taken by the pilot to terminate the takeoff roll, for example by closing all throttles. Proposed § 25.703(b) is revised accordingly.

Another commentator objected to the proposal, stating that the warning system would eliminate reliance on the checklist and induce more hazards than it is designed to eliminate. The FAA does not agree that the warning system would eliminate reliance on the checklist; instead it would serve as a back-up for the checklist, particularly in unusual situations, e.g., where the checklist is interrupted or the takeoff is delayed. The commentator stated that the additional aural warning system would add to the problem of cockpit confusion caused by the multitude of aural warning requirements. The FAA does not agree since the takeoff warning would occur during the initial portion of the takeoff roll and therefore should not be confused with flight over-speed warning, stall warning, or landing gear warning during approach. The commentator added that it is doubtful if a reliable, practical, safe system can be designed, much less for a cost that would approximate the possible benefits. The FAA does not agree since such systems have been developed and used on relatively complex airplanes. The warning systems can be simpler on airplanes having fewer or less critical variable geometry devices.

One commentator recommended that consideration be given to including unreleased brakes in the takeoff warning system in view of the serious consequences of failing to release brakes fully before takeoff. The FAA does not now have sufficient information to justify adopting the suggestion made by this commentator.

The proposed new § 25.703 is adopted with the revisions discussed above and a non-substantive revision for clarity.

Proposal 6-51. One commentator suggested the use of the word "suspended" rather that "silenced" in proposed § 25.729(e)(3). The FAA agrees with this suggestion, since it would result in consistency of wording between this section and proposed § 23.729(f)(1). Section 25.729(e)(3) is revised accordingly.

Proposal 6-52. For comments related to the proposal to revise § 25.1043(b), see Proposal 6-23.

Proposal 6-53. No unfavorable comments were received on the proposal to revise § 25.1501. Accordingly, the proposal is adopted without substantive change.

Proposal 6-54. For comments related to the proposal to revise § 25.1521(e), see Proposal 6-23.

Proposals 6-55 and 2-96. One commentator recommended that proposed § 25.1581(a)(2), which would require that the Airplane Flight Manual contain "Other information necessary for safety," be deleted. He stated that the proposed requirement would be far too broad, and could include all information now provided in the crew operating manual. The FAA agrees that the proposed wording may be too broad, but does not agree that all requirements for additional information should be eliminated. Section 25.1581(a)(2) as adopted requires other information that is necessary for safe operation because of design, operating, or handling characteristics. This wording is the same as current § 25.1581(c), except that the word "unusual" is deleted for the reasons stated in notice.

The same commentator also recommended deletion of proposed § 25.1581(b), which would require that each part of the manual containing required information be approved, segregated, identified, and clearly distinguished from each unapproved part of the manual. The commentator stated that he is not aware of any unapproved sections of the Airplane Flight Manual, and that the proposal implies a crew manual with the FAA limitation data so marked. The FAA does not agree with the recommended deletion of this requirement. The proposed paragraph is the same as current § 25.1581(b), and is intended to cover cases where the applicant desires to include information in the manual that is not required by the FAA.

Proposal 6-55 to amend § 25.1581 is adopted with the revisions discussed above.

The disposition of Proposal 2-96, which proposed to add a new § 25.1581(d) (Notice 75-10) was deferred so that it could be considered in connection with Proposal 6-55. No unfavorable comments were received on Proposal 2-96 and the proposal to add a new § 25.1581(d) is adopted without substantive change.

Proposal 6-56. For comments related to the proposal to amend § 25.1583, see Proposal 6-23.

Proposals 6-57 and 2-87. No unfavorable comments were received on the proposal to amend § 25.1585. Accordingly, the proposal is adopted without substantive change.

Disposition of Proposal 2-87 to amend § 25.1353 (Notice 75-10) was deferred so that it could be considered in connection with Proposal 6-57. Proposals 2-89, 2-131, and

2–186 to amend §§ 23.1353, 27.1353, and 29.1353, respectively (Notice 75–10), are substantively identical to Proposal 2–87 and all of these proposals are discussed below.

Commentators suggested that proposed §§ 25.1353(c)(5) and 29.1353(c)(5) be revised by adding the word "or" between paragraphs (c)(5)(i) and (c)(5)(ii) to allow an alternative design. The commentators misinterpreted the proposal. The sections as adopted provide for three alternatives with an "or" between paragraphs (c)(5)(ii) and (c)(5)(iii) and with an "or" understood between paragraphs (c)(5)(i) and (c)(5)(ii).

One commentator suggested that the proposals should be broadened to include nickel cadmium battery installations other than those capable of being used to start an engine or an auxiliary power unit. The proposals apply only to nickel cadmium batteries that are subject to a rapid drain because they are used to start an engine or auxiliary power unit. The FAA does not have enough information to indicate that in other installations the drain on nickel cadmium batteries is sufficiently rapid to require compliance with the proposed provisions.

One commentator objected to proposed §§ 27.1353(f) and 29.1353(c)(5) on the basis that the requirement should be limited to nickel cadmium batteries other than 20-cell batteries and to only certain battery locations. The commentator also stated that the requirement for helicopters should be different from that for airplanes since helicopters are able to execute an emergency landing much quicker than airplanes. The FAA has insufficient information at the present time to warrant any of the distinctions suggested by the commentator.

The FAA believes that the requirement in proposed § 25.1353(c)(5) concerning operating procedures in the Airplane Flight Manual should be transferred to § 25.1585(a), since that section pertains to operating procedures. The proposal for § 25.1353(c)(5) is revised and § 25.1585(a) amended accordingly. The remainder of proposed § 25.1353(c)(5) is redesignated § 25.1353(c)(6) in view of the adoption of a new § 25.1353(c)(5) in Amendment No. 5. The same revisions are also made to proposed §§ 23.1353(f), 27.1353(f), and 29.1353(c)(5), designated as §§ 23.1353(g), 27.1353(g), and 29.1353(c)(6), respectively, and to §§ 23.1585, 27.1585, and 29.1585.

Proposals 6–58 and 2–98. Proposed §§ 25.1587(c)(5) and (c)(6), which would add requirements for information on the vertical distance for transition to approach climb determined under proposed § 25.121(e) (Proposal 6–38), and on the en route net flight path data determined under proposed § 25.123 (Proposal 6–39), are withdrawn in view of the withdrawal of Proposals 6–38 and 6–39.

Disposition of Proposal 2–98 to revise § 25.1587 (Notice 75–10) was deferred so that it could be considered in connection with Proposal 6–58. No unfavorable comments were received on Proposal 2–98 and it is adopted as proposed except that the reference in proposed § 25.1587(b)(4) to § 25.101(c) is changed to reference §§ 25.101(f), (g), and (h). Current § 25.1587(c)(3), on which proposed § 25.1587(b)(4) is based, was adopted as part of the recodification of Part 4b of the Civil Air Regulations, effective February 1, 1965 (29 FR 18289). Specifically, § 25.1587 replaced § 4b.743 of the CARs and § 4T.743 of Special Civil Air Regulation 422B. Section 4T.743(c), which was replaced by § 25.1587(c)(3), referenced § 4T.111(c) and the requirements of § 4T.111(c) are now contained in §§ 25.101(f), (g), and (h), not § 25.101(c) as the current rule indicates. The purpose of the recodification program was simply to clarify the regulations. No substantive changes, other than relaxatory ones that were completely noncontroversial, were intended. The FAA believes that the change being made is a nonsubstantive editorial change since § 25.1587(c)(3) has been consistently interpreted in accordance with the rule as originally set forth in § 4T.743(c) of Special Civil Air Regulation 422B.

Proposal 6–59. For comments related to the proposal to amend § 27.25(b), see Proposal 6–5. The proposal to amend § 27.25(b) is adopted without substantive change.

Proposal 6–60. For comments related to the proposal to amend § 27.29, see Proposal 6–5.

Proposal 6–61. Proposed new §§ 27.33(e) and 29.33(e) (Proposal 6–77) would require a main rotor low-speed warning for each single engine helicopter and each multiengine helicopter that does not have an approved device that automatically increases power on the operating engines when one engine fails. Several commentators stated that operating experience does not indicate the need for a main rotor low-speed warning and that the instruments furnished the pilot are adequate to monitor rotor r.p.m. safely. One of these commentators also stated that if the warning is set high enough to be effective, the pilot will rely on it in lieu of monitoring rotor r.p.m. as he should and that the warning will activate during low r.p.m. transients which are entirely safe and this may cause pilot action that is unsafe. The commentator stated that since the National Transportation Safety Board (NTSB) has recommended an engine failure warning device on all turbine engines, this proposal should be withdrawn or deferred until action has been taken on the NTSB recommendations. The FAA does not agree. In regard to the comments concerning monitoring of instruments and rotor r.p.m. by the pilot, it should be noted that one of the main reasons for providing rotor low-speed warning is to assist the pilot in maintaining safe rotor speed after an engine failure when his attention is directed to flight path control and emergency procedures. With respect to activation of the warning during low-rotor r.p.m. transients, the FAA believes that the warning can be set to avoid nuisance warnings in normal maneuvers and still meet the requirements of this section. The NTSB Release for Safety Recommendations A-75-72 and 73, issued September 2, 1975, recommended that Parts 27 and 29 be amended to require that all turbine engine-powered helicopters be equipped with a prominent engine-out visual warning system and an aural warning system which can be heard with or without the use of a headset. The FAA believes, as stated in its response to the NTSB, that the proposed requirement for rotor low-speed warning is more desirable than an engine-out warning since a rotor low-speed warning would warn the pilot of an unsafe low rotor speed due to any cause, including engine failure, and will continue the warning function during power-off descent and landing.

One commentator noted that the FAA has imposed special conditions requiring engine-out warnings on certain turbine engine-powered helicopters, and stated that engine-out warnings should not be required in addition to rotor low-speed warning. The FAA does not believe it will be necessary to issue a special condition requiring installation of an engine-out warning on those helicopters with a rotor low-speed warning.

One commentator objected to the deletion of §§ 27.33(b)(3) and 29.33(b)(3). Current §§ 27.33(b)(1), (b)(2), and (b)(3) (and §§ 29.33(b)(1), (b)(2), (b)(3)) provide, for all rotorcraft, three alternative methods for showing that main rotor speeds substantially less than the minimum approved main rotor speed will not occur under any sustained flight condition with power on. One of the alternatives, paragraph (b)(3), is to provide adequate means to warn the pilot of unsafe main rotor speeds, but the proposal would delete this paragraph, thus requiring all rotorcraft to comply with paragraph (b)(1) or (b)(2). This was not the intent of the proposal. Accordingly, §§ 27.33(b)(3) and 29.33(b)(3) are retained. In addition, for clarification, the lead-in of §§ 27.33(b) and 29.33(b) are revised so that they are only applicable to rotorcraft that are not required to have a main rotor low-speed warning under § 27.33(e) or § 29.33(e), respectively.

Proposal 6-62. Two commentators objected to the proposals for §§ 27.45 and 29.45, stating that the basis for humidity levels has not been determined and varies between engines. These commentators further stated that there is no industry agreement on the effect of humidity on power or that humidity has a significant effect on power. The effects of humidity on the power of reciprocating engines are well understood and are generally the same between engine types. The effects of humidity on the power or thrust of turbine engines may differ between engine types. The proposal, however, establishes a reference humidity structure for the development of rotorcraft performance data. It does not prejudge the nature of the corrections, if any, which may be required. Each turbine engine must be evaluated to determine the effect of humidity on thrust or power, and, where rotorcraft performance is affected, it must be based on the humidity reference condition.

One commentator objected to the proposals on the basis that the humidity reference for turbine engine-powered rotorcraft may not be representative of average humidity conditions encountered in service. No safety problem has been identified with the use of the proposed humidity reference in the type certification of transport category airplanes, and the reference is considered equally valid for the type certification of rotorcraft.

One commentator questioned why a reciprocating engine-powered rotorcraft would be required to use a humidity correction different from that for turbine engine-powered rotorcraft. The humidity correction proposed for reciprocating engine-powered rotorcraft is similar to the current requirements for reciprocating engine-powered transport category airplanes and the proposed humidity correction for turbine engine-powered rotorcraft is similar to the current requirements for turbine engine-powered transport category airplanes, and the requirements for transport category airplanes have been administered without difficulty. In addition, the humidity correction requirements for turbine engine-powered rotorcraft are based on the fact that the power or thrust of turbine engines diminishes significantly as the ambient atmospheric temperature is increased. Power or thrust variations related to humidity could therefore have an adverse effect upon safety at temperatures above standard.

The proposal to revise § 27.45 and the proposal to amend § 29.45 are adopted without substantive change.

Proposals 6–63 and 2–100. Under proposed § 27.65(b)(2), if the never-exceed speed V_{NE} is less than the best rate-of-climb speed V_Y at any altitude within the range for which certification is requested, the steady rate of climb must be determined over the entire range of weights, temperatures, and altitudes for which certification is requested. One commentator recommended that the rate of climb information be required only for the range of altitudes where V_{NE} is less than V_Y, instead of the entire range of altitudes. The FAA disagrees. The climb performance and speed of a helicopter may change significantly below, as well as above, the altitude at which V_{NE} is less than V_Y. However, after further review, the FAA believes that it is only necessary that climb data be determined over the range of altitudes from 2,000 feet below the altitude at which V_{NE} is equal to V_Y up to the maximum altitude for which certification is requested. The proposal to amend § 27.65 is revised accordingly.

In addition, proposed § 27.65(b)(2)(i) is revised to allow the rate-of-climb to be determined at the climb speed selected by the applicant (instead of the most favorable climb speed) at or below V_{NE}. The FAA believes that the proposed paragraph (b)(2)(i) would impose an unnecessary burden on the applicant and result in complex operating information, since the most favorable climb speed may be a function of several variables.

Disposition of Proposal 2–100 to amend § 27.65(a)(2) (Notice 75–10) was deferred so that it could be considered in connection with Proposal 6–63. No unfavorable comments were received on the proposal to amend § 27.65(a)(2). Accordingly, the proposal is adopted without substantive change.

Proposal 6–64. Proposed § 27.67(c) would require the determination of the one-engine-inoperative steady rate of climb with maximum continuous power on the operating engines, and (for helicopters for which certification for the use of 30-minute power is requested) at 30-minute power. One commentator said that there is no need to show the climb performance data for both the maximum continuous and 30-minute power levels and, therefore, the word "and" preceding the parenthetical expression should be changed to "or". The FAA does not agree. Even though an applicant may request certification for the use of 30-minute power, climb performance data for maximum continuous power should be furnished to the pilot for use in operations that may require more than 30 minutes to reach a safe landing area after failure of one engine, e.g., over-water operations. Accordingly, § 27.67(c) is adopted without substantive change.

Proposal 6–65. No unfavorable comments were received on the proposal to revise § 27.75(a)(2)(ii). Accordingly, the proposal is adopted without substantive change.

Proposal 6–66. No unfavorable comments were received on the proposal to amend § 27.143. Accordingly, the proposal is adopted without substantive change.

Proposal 6–67. No unfavorable comments were received on the proposal to revise § 27.175(c). Accordingly, the proposal is adopted without substantive change.

Proposal 6–68. For comments related to the proposal to revise § 27.1043(b), see Proposal 6–23.

In addition, a nonsubstantive editorial change is being made to the lead-in of § 27.1043 (a) to reference § 27.1041(b) instead of § 27.104(b).

Proposal 6–69. No unfavorable comments were received on the proposal to revise § 27.1501. Accordingly, the proposal is adopted without substantive change.

Proposals 6–70 and 2–135. Disposition of Proposal 2–135 to amend § 27.1545 (Notice 75–10) was deferred so it could be considered in connection with Proposal 6–70 to amend § 27.1505. No unfavorable comment was received on Proposal 2–135. Accordingly, the proposal is adopted without substantive change.

Proposed §§ 27.1505(c) and 29.1505(c) (Proposals 6–70 and 6–84, respectively) would allow the establishment of a never-exceed speed, V_{NE} (power-off), that is less than V_{NE} with power on, if V_{NE} (power-off) is not less than a speed midway between the power-on V_{NE} and the speed for maximum range in autorotation at maximum weight. One commentator recommended that "V_Y or the climb speed selected by the applicant in demonstrating compliance with the climb requirements" be inserted in proposed § 27.1505(c) in place of the speed for maximum range in autorotation. The commentator stated that since determination of the speed for maximum range in autorotation is not presently required, the substitution of the climb speed (which is determined under the climb requirements in §§ 27.65 or 27.67) would accomplish the intent of placing a lower limit on V_{NE} (power-off) without unnecessary additional demonstration requirements.

After further consideration, the FAA believes that the speed used in determining climb performance (one-engine-inoperative climb performance, if applicable) should be used in establishing a V_{NE} (power-off) for both Part 27 and 29 helicopters, instead of the speed for maximum range in autorotation at maximum weight. The speed midway between power-on V_{NE} and the appropriate climb speed is expected to be high enough to provide the pilot with an adequate range of speeds and glide angles during autorotation. In addition, the determination of V_{NE} (power-off) will be based on information already required to be furnished by the applicant which would not be the case if the speed for maximum range in autorotation were prescribed since it is only required to be determined for certain Part 29 Category B helicopters. The proposals to amend §§ 27.1505 and 29.1505 are revised accordingly.

Proposal 6–71. For comments related to the proposal to add a new § 27.1521(f), see Proposal 6–23.

Proposal 6–72. No unfavorable comments were received on the proposal to add a new § 27.1527. Accordingly, the proposal is adopted without substantive change.

[For discussion concerning the amendment of § 27.1545, see Proposals 6–70 and 2–135.]

Proposals 6–73, 2–139 and 2–140. No unfavorable comments were received on Proposal 6–73 to amend § 27.1581. The proposal is adopted without substantive change, except that proposed § 27.1581(a)(2) is revised in accordance with the discussion of the proposal to amend § 25.1581 (Proposal 6–55).

Disposition of Proposals 2–139 to amend § 27.1581 and 2–140 to amend § 27.1587 was deferred so that these proposals could be considered in connection with Proposal 6–73. No unfavorable comments were received on Proposal 2–139 or Proposal 2–140. Proposal 2–139 to amend § 27.1581 is adopted without substantive change. For reasons that are stated in the discussion of Proposal 6–23 for § 23.1521(e), Proposal 2–140 to amend § 27.1587 is revised by adding a new § 27.1587(a)(2)(iii) requiring information on the maximum ambient atmospheric temperature at which compliance with the cooling requirements was shown. Additionally, the parenthetical phrase "(if provided)" is deleted from § 27.1587(b) since the amendment to § 27.1581 requires that a Rotorcraft Flight Manual be furnished for each rotorcraft. The proposal to amend § 27.1587 is adopted with the changes discussed above.

Proposal 6–74. For comments related to the proposal to amend § 27.1583, see Proposal 6–23.

Proposals 6–75 and 2–131. Proposed §§ 27.1585(c) and 29.1585(c) would require the operating procedures section of the Rotorcraft Flight Manual to contain information on the procedures for reducing airspeed to V_{NE} (power-off) for helicopters for which a V_{NE} (power-off) is established under §§ 27.1505(c) and 29.1501(c), respectively. One commentator stated that he did not favor systematically placing explicit engine, altitude, and V_{NE} (power-off) limitations in the "limitations" chapter of the Flight Manual. The commentator apparently misinterpreted the proposal, as it would affect only the operating procedures section, not the limitations section. The commentator also stated that these explanations should only be required when they bring significant information to the pilot and when the limitation results from an indirect and not an obvious cause. The

FAA believes that in view of the surprise element that may be associated with engine failure in service operations, the procedure for reducing airspeed to not more than V_{NE} (power-off) should be furnished for each helicopter for which a V_{NE} (power-off) is established. Accordingly, the proposals for §§ 27.1585(c) and 29.1585(c) are adopted without substantive change.

Disposition of Proposal 2–131 to amend § 27.1353 (Notice 75–10) was deferred so that it could be considered in connection with Proposal 6–73. For comments related to proposed § 27.1353(f) and for an explanation of the revision to proposed § 27.1353(f), see the discussion of Proposal 2–87 under Proposal 6–57.

Proposal 6–76. For comments related to the proposal to amend § 29.29, see Proposal 6–5.

Proposal 6–77. For comments related to the proposed amendment of § 29.33, see Proposal 6–61 for § 27.33.

Proposal 6–78. For comments related to proposed § 29.45, see Proposal 6–62.

Proposal 6–79. One commentator recommended that proposed § 29.65(c) be revised to require climb data only for those altitudes where V_{NE} is less than V_y at sea level. For a discussion of this comment and the explanation for the revisions to proposed § 29.65(c), see Proposal 6–63. This commentator also stated that proposed § 29.65(c) is superfluous for Category B rotorcraft since it duplicates the requirement of proposed § 29.65(a)(4). The FAA agrees that some clarification is needed and proposed § 29.65(a) and (c) are revised to list all of the Category B requirements in paragraph (a) and to make paragraph (c) applicable only to Category A helicopters. For an explanation of the revisions to proposed § 29.65(c)(1), see the discussion of the revision to proposed § 27.65(b)(2)(i) under Proposal 6–63. Accordingly, the proposal is adopted with the revisions discussed above and under Proposal 6–63.

Proposal 6–80. No unfavorable comments were received on the proposal to amend § 29.143. Accordingly, the proposal is adopted without substantive change.

Proposal 6–81. No unfavorable comments were received on the proposal to revise § 29.175(g). Accordingly, the proposal is adopted without substantive change.

Proposal 6–82. For comments related to the proposal to revise § 29.1043(b), see Proposal 6–23.

Proposal 6–83. No unfavorable comments were received on the proposal to revise § 29.1501. Accordingly, the proposal is adopted without substantive change.

Proposals 6–84 and 2–188. For comments related to Proposal 6–84 to amend § 29.1505, and for an explanation of the revisions to proposed § 29.1505(c), see Proposal 6–70.

Disposition of Proposal 2–188 to amend § 29.1545 (Notice 75–10) was deferred so that it could be considered in connection with Proposal 6–84 to amend § 29.1505. No unfavorable comments were received on Proposal 2–188. Accordingly, the proposal is adopted without substantive change.

Proposal 6–85. For comments related to the proposal to revise § 29.1521(e), see Proposal 6–23.

Proposal 6–86. No unfavorable comments were received on the proposal to add a new § 29.1527. Accordingly, the proposal is adopted without substantive change.

[For discussion concerning the amendment of § 29.1545, see Proposals 6–84 and 2–188.]

Proposals 6–87 and 2–192. Proposal 6–87 proposed to revise § 29.1581(a) and (b) and to delete § 29.1581(c) and mark it "[Reserved]." Disposition of Proposal 2–192 to add a new § 29.1581(d) (Notice 75–10) was deferred so that it could be considered in connection with Proposal 6–87.

No unfavorable comment was received on Proposals 6–87 or 2–192. These proposals to amend § 29.1581 are adopted without substantive change except that proposed § 29.1581(a)(2) is revised in accordance with the discussion of the proposal to amend § 25.1581 (Proposal 6–55).

Proposal 6–88. For comments related to the proposal to amend § 29.1583, see Proposal 6–23.

Proposals 6–89 and 2–186. For comments related to Proposal 6–89 to add a new § 29.1585(c), see Proposal 6–75.

Disposition of Proposal 2-186 to amend § 29.1353 (Notice 75-10) was deferred so that it could be considered in connection with Proposal 6-89. For comments related to proposed § 29.1353(c), see the discussion of Proposal 2-87 under Proposal 6-57.

Proposal 6-90. No unfavorable comments were received on the proposal to amend § 91.31. Accordingly, the proposal to amend § 91.31 is adopted without substantive change.

Proposal 6-91. The proposal to amend § 91.37 was made to implement Proposals 2-49, 2-51, 2-52, and 2-93 to amend §§ 25.105, 25.125, 25.241 and 25.1533, respectively, contained in Airworthiness Review Notice No. 2 (Notice 75-10). Since the proposed amendments to Part 25 have been withdrawn (41 FR 55454), Proposal 6-91 is also withdrawn.

Proposal 6-92. Proposed § 121.141(b) would authorize an air carrier to revise the operating procedures and the format of the performance data for the applicable Airplane or Rotorcraft Flight Manual and include the revised information in the operator's manual required by § 121.133, if the revised procedures and performance data presentation are approved by the Administrator and are clearly identified as flight manual requirements. One commentator said that there was no need for the identification of the flight manual material. This requirement is in the current rule and the FAA does not have sufficient information at the present time to justify deleting it, especially with regard to the operating limitations.

The commentator also suggested that the second sentence of proposed § 121.141(b) would be clarified by inserting a clause indicating that if the certificate holder elects to carry the manual required by § 121.133, he must retain all of the limitations section (of the flight manual) as written, unless deviations are specifically authorized by the Administrator. The FAA does not believe that the suggested change is necessary or appropriate. Proposed § 121.141(b) would not authorize a change in the substance or presentation of the operating limitations required for the applicable flight manual. Accordingly, the proposal to revise § 121.141(b) is adopted without substantive change.

DRAFTING INFORMATION

The principal authors of this document are Paul C. Spiess and Charles J. Maple, Flight Standards Service, and Keith S. May, Office of the Chief Counsel.

ADOPTION OF THE AMENDMENT

Accordingly, Parts 1, 21, 23, 25, 27, 29, 91, and 121 of the Federal Aviation Regulations are amended, effective March 1, 1978.

(Secs. 313(a), 601, 603, 604, and 605 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425); and sec. 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).)

NOTE.—The Federal Aviation Administration has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Order 11821, as amended by Executive Order 11949, and OMB Circular A-107.

Amendment 21-47

Civil Supersonic Airplanes
Noise and Sonic Boom Requirements

Adopted: June 26, 1978 **Effective: July 31, 1978**

(Published in 43 FR 28406, June 29, 1978)

SUMMARY: These final rules (1) require all civil supersonic airspaces (SSTs), except Concordes with flight time before January 1, 1980 (presently expected to include 16 Concordes), to comply with the noise limits of Part 36 of Title 14 of the Code of Federal Regulations ("Part 36") that were originally applied to subsonic airplanes, in order to operate in the U.S.; (2) prohibit the issuance of U.S. Standard Airworthiness Certificates to Concordes that do not have flight time before January 1, 1980 and that do not comply with Part 36; (3) prohibit the operation in the U.S. of the excepted Concorde airplanes if they have been modified in a manner that increases their noise; (4) prohibit scheduled operations of the excepted Concorde airplanes at U.S. airports between 10 p.m. and 7 a.m., and (5) prohibit SSTs that are outside the U.S. from causing sonic booms in the U.S. when flying to or from U.S. airports. These provisions respond to the public need for the control of sonic boom and SST noise in accordance with § 611 of the Federal Aviation Act of 1958, as amended by the Noise Control Act of 1972. These rules do not establish certification noise limits for future design SSTs, since the technological feasibility of such standards is at present unknown. The FAA's goal is not to certificate, or permit to operate in the United States, any future design SST that does not meet standards then applicable to subsonic airplanes. This rule is issued following close coordination with the U.S. Environmental Protection Agency (EPA). A detailed discussion of FAA's disposition of EPA's proposals concerning SST noise is contained in a separate Notice of Decision published in this issue of the Federal Register.

FOR FURTHER INFORMATION CONTACT:

Mr. Richard Tedrick,
Program Management Branch (AEQ-220),
Environmental Technical and Regulatory Division, Office of Environmental Quality,
Federal Aviation Administration,
800 Independence Avenue, S.W.,
Washington, D.C. 20591; telephone (202) 755-9027.

SUPPLEMENTARY INFORMATION

I. SYNOPSIS

A detailed section-by-section analysis of these rules is furnished at the conclusion of this preamble. Briefly, these rules are substantively the same as those proposed in Notice No. 77-23 on October 13, 1977, and have the following effects:

A. SST OPERATIONS IN THE UNITED STATES

Except for the 16 Concordes which are expected to have flight time before January 1, 1980, all SSTs are required by these rules to comply with the noise limits of Part 36 in effect on January 1, 1977 ("Stage 2 noise limits") in order to operate in the United States. These are the same noise limits that were originally applicable to subsonic airplanes by Part 36. It is the FAA's goal not to certificate or permit to operate in the United States any future design SST that does not meet standards then applicable to new design subsonic airplanes. Accordingly, consistent with technological developments, the noise limits in this rule are expected to be made more stringent before a future design SST is either type certificated or permitted to operate in the United States.

B. THE FIRST 16 CONCORDES

The first 16 Concordes, which is the maximum number that the Britain and France are expected to manufacture before January 1, 1980, are expected from compliance with the Stage 2 noise limits of Part 36. There is presently no expiration date on this exception. However, under these rules, the excepted Concordes may not be operated on flights scheduled, or otherwise planned, for takeoff or landing at U.S. airports after 10 p.m. and before 7 a.m. local time. Moreover, these rules subject the expected Concordes that operate in the U.S. to an "acoustical change" requirement identical to that applied to U.S. type certificated subsonic airplanes that have not been shown to comply with Stage 2 noise limits. Like those subsonic airplanes (which are called "Stage 1 airplanes" in Part 36), the noncomplying Concordes may not be operated in the U.S. if their design is changed in a way that increases their noise levels.

C. LATER CONCORDES: "NEW PRODUCTION" RULE

Although it is expected that Concordes will not be produced beyond January 1, 1980, such production is possible. Accordingly, for any Concorde that does not have flight time before January 1, 1980, this rule prohibits the issuance of a U.S. Standard Airworthiness Certificate unless the airplane complies with at least the Stage 2 noise limits of Part 36.

D. CONCORDE TYPE CERTIFICATION: NOISE LIMITS

The British-French Concorde is the only SST for which application has been made for a U.S. type certificate. A U.S. type certificate constitutes FAA approval of the safety and environmental aspects of an airplane type and is necessary for American air carriers to operate the airplane. Because there is no presently known technology which would reduce Concorde noise levels, the maximum noise limits (or approach, takeoff, and sideline) authorized at this time by these rules for the purposes of a U.S. type certificate are the current noise levels of that airplane.

E. CONCORDE TYPE CERTIFICATION: TEST PROCEDURES

These rules broaden the detailed noise measurement and evaluation procedures of Part 36 to cover supersonic (as well as subsonic) civil airplanes. In addition, various flight test provisions unique to the Concorde are included because of the special takeoff and approach testing considerations posed by the delta wing of that airplane.

F. AIRPORT PROPRIETORS' "LOCAL OPTION": NO CHANGE

These rules do not in any way affect existing legal authority of airport proprietors, acting as proprietors, to exercise their "local option" to limit the use of their airports in a manner that is not unjustly discriminatory, and does not unduly burden interstate and foreign commerce. As stated in § 36.5 of Part 36, an FAA determination of compliance or noncompliance with Part 36 does not bind an airport proprietor in its determination whether an airplane is acceptable or unacceptable for operation at its airport.

G. SONIC BOOM

These rules prohibit SSTs from producing sonic booms in the United States while they are going to or from U.S. airports, even if the airplane is outside the U.S. at the time. Prior to these rules, supersonic flight was prohibited only while the airplane itself was in United States airspace.

H. CONTINUED OPERATIONS OF CONCORDE

Consistent with the provisions of these rules, FAA amendments to operations specifications of air carriers that operate Concorde may be issued without additional environmental analysis up to the numbers of total Concorde operations specified for each airport analyzed in the final environmental impact statement (EIS) for these rules. Federal issuance or amendment of operations specifications has no bearing on local airport proprietor approval of Concorde operations.

By the terms of the FAA operations specifications issued to the British Airways and Air France in April 1976, the 16-month demonstration period at Dulles Airport ended September 24, 1977. After Secretary of Transportation Brock Adams announced his decision on September 23, 1977 to issue Notice No. 77-23, the two carriers were issued amendments to their operations specifications to permit the number of Concorde operations that were originally approved on February 4, 1976 (one flight per day per carrier) to continue until the issuance of these rules. After the effective date of these rules, upon application by an air carrier, Concorde operations will be authorized at Dulles International Airport up to the numbers specified in the EIS for these rules.

The 16-month demonstration period at John F. Kennedy International Airport ("JFK"), for which two Concorde flights per day for each carrier were authorized, began on November 22, 1977. However, the issuance of these rules supersedes that authorization. Authorization of Concorde operations up to the number studied in the EIS will not require further environmental analysis.

I. CONSISTENCY WITH SAFETY

These rules regulate only the noise of SSTs. They do not dispose of airworthiness issues concerning the Concorde that are currently being evaluated under applicable airworthiness regulations. These rules are consistent with the highest degree of safety in air commerce.

J. FUTURE SSTS: PROGRESSIVE NOISE REDUCTION

With the issuance of these rules, the FAA takes the first step towards ensuring that future SSTs are subject to the same noise levels as subsonic aircraft, and are made as fully compatible with future airport environments as possible. It is anticipated that no future SST design will be type certificated without the issuance by the FAA, after full public participation, of noise regulations that are environmentally effective and consistent with the economic and technological considerations in § 611 of the Federal Aviation Act of 1958.

* * * * *

VI. SECTION-BY-SECTION ANALYSIS

These rules amend provisions in three parts of the Federal Aviation Regulations—Part 21 (14 CFR Part 21), which contains the procedural requirements for the certification of aeronautical products; Part 36 (14 CFR Part 36), which contains the substantive noise limits and related noise measurement and test procedures that must be complied with for the issuance of type certificates and airworthiness certificates; and Part 91 (14 CFR Part 91), which sets forth the flight and other requirements that apply to the operation of aircraft.

A. CHANGES TO PART 21 (14 CFR PART 21)

1. Acoustical Change: Certification.

Section 21.93(b)(1) and (2) are amended by deleting the word "subsonic." The effect of this amendment is to make the definition of the term "acoustical change" equally applicable to supersonic and subsonic airplanes. Under these procedures, for both supersonic and subsonic airplanes, an "acoustical change" exists whenever a voluntary change in the type design of airplane is applied for that might increase the noise levels of the airplane. Therefore, for both supersonic and subsonic airplanes, the acoustical change provisions of Part 36 (§ 36.7) must be complied with prior to approval of that type design change (see also the discussion of the proposed change to § 36.7 and § 91.309(b)(1), below).

2. SST "New Production" Rule.

Section 21.183(e)(1) is amended by deleting the word "subsonic." The effect, for supersonic as well as subsonic airplanes, is that a standard airworthiness certificate (which is the class of air airworthiness certificate required for U.S. air carrier operation and similar operations) is not issued for airplanes that have not had flight time before the dates specified in Part 36 (§ 36.1(d)), unless compliance with the applicable noise standards in Part 36 is shown. (See also the discussion of the proposed revision of § 36.1(d).) This would extend, to SSTs, the rules applied to subsonic airplanes in Amendment 36-2 – popularly called the "new production" rule published in the FEDERAL REGISTER (38 FR 29569) on October 26, 1973.

* * * * *

Accordingly, Chapter I of Title 14 of the Code of Federal Regulations is amended, effective July 31, 1978.

(Secs. 307, 313(a), 601(a), 603, 611, Federal Aviation Act of 1958, as amended (49 U.S.C. §§ 1348, 1354(a), 1421(a), 1423, and 1431); sec. 6(c), Department of Transportation Act (49 U.S.C. § 1655(c); Title I, National Environmental Policy Act of 1969 (42 U.S.C. §§ 4321 et seq.); Executive Order 11514, March 5, 1970).

NOTE: The complete preamble to Amendment 21-47 is contained in Part 91, Amendment 91-153.

Amendment 21-48

Export Airworthiness Approvals

Adopted: March 6, 1979 **Effective: April 16, 1979**

(Published in 44 F.R. 15648, March 15, 1979)

SUMMARY: This amendment provides for the issuance of export certificates of airworthiness for unassembled normal category rotorcraft and export airworthiness approvals for aeronautical products that do not meet certain procedural requirements in cases where the importing country agrees to accept the products in such condition. This amendment will relieve applicants for export airworthiness approvals from unnecessary burdens with no adverse effect on safety. The amendment also updates certain form number references.

FOR FURTHER INFORMATION CONTACT:

Raymond E. Ramakis, Regulatory Projects Branch, Safety Regulations Division, Flight Standards Service, Federal Aviation Administration, 800 Independence Avenue,S.W., Washington, D.C. 20591; telephone (202) 755-8716

SUPPLEMENTARY INFORMATION: This amendment is based on a notice of proposed rule making issued as Notice 77-19 and published in the FEDERAL REGISTER on September 1, 1977, (42 F.R. 43985).

Notice 77-19, in addition to proposing to amend the export airworthiness approval requirements, also proposed certain changes to the Parts Manufacturer Approval (PMA) requirements. Notice 77-19A (42 F.R. 61048; December 1, 1977) reopened the comment period for the PMA proposals until January 4, 1978, and Notice 77-19B (43 F.R. 15432; April 13, 1978) reopened the comment period for the PMA proposals until May 15, 1978. This amendment excludes any consideration of the PMA proposals contained in Notice 77-19. As indicated in Notice 77-19B, PMA will be the subject of a separate rulemaking action.

Interested persons have been afforded an opportunity to participate in the making of this amendment and due consideration has been given to all matter presented. Three comments pertaining to the proposals to amend the export airworthiness approval requirements were received and they are discussed below.

BACKGROUND AND DISCUSSION OF COMMENTS

The primary purpose of an export airworthiness approval is to notify the importing country as to the airworthiness status of the product involved. Such notification serves the needs of both the foreign airworthiness authority approving a product for import and the purchaser of the purchaser of the product who intends to place it in operation.

Under regulations in effect since 1965, the requirements and procedures for export airworthiness approvals have helped to assure the export of quality products that meet safety standards at least as high as those applicable to products for domestic use. Moreover, even though an importing country has its own airworthiness authority capable of determining the airworthiness status of a product, U.S. regulations have required essentially full compliance with the FAA standards as a condition for issuance of a U.S. export airworthiness approval. In this connection, the regulations have provided only limited exceptions under which an importing country may elect to receive U.S.-manufactured products that are not in full compliance with FAA standards.

Section 21.325(b), in part, requires that new aircraft be assembled and flight-tested in order to qualify for export airworthiness approvals. By rule to date, only small airplanes and gliders manufactured under production certificates have been excepted from these requirements, subject to individual approvals by the importing countries. However, one U.S. rotorcraft manufacturer has been granted an exemption to allow similar treatment of its unassembled normal category rotorcraft.

Sections 21.329, 21.331, and 21.333 specify the standards and maintenance requirements which must be met by the various classes of aeronautical products in order to qualify for export airworthiness approvals. These regulations to date have contained no provision for allowing importing countries to waive any of these requirements. However, the FAA has issued a number of exemptions from § 21.329(e) to allow issuance of export certificates of airworthiness for used engines that have not been newly overhauled, subject to approval of the importing country.

Based on satisfactory experience with the limited regulatory exception pertaining to unassembled aircraft, and with the exemptions granted to date, the FAA has concluded that the export airworthiness regulations may be amended with no derogation of safety. Under this amendment, the primary purpose of export airworthiness approvals continues to be achieved and the same high standards for issuance of export airworthiness approval remain in effect. However, the amendment recogizes the ability of knowledgeable foreign airworthiness authorities to determine when strict compliance with FAA standards is not necessary or not desired by their respective countries in specific cases.

The procedures adopted by this amendment will relieve U.S. manufacturers and exporters of a number of burdens heretofore associated with obtaining export airworthiness approvals. The manufacturers of normal category rotorcraft will be able to realize cost and time savings by eliminating assembly and flight test. Moreover, the export of unassembled aircraft will eliminate the burden of an actual weighing and will facilitate air freight shipments. Provisions for non-compliance with requirements of the various classes of products subject to acceptance by the importing country, for example the requirement that used engines be newly overhauled, make possible substantial savings without derogating safety. Such savings increase the export potential of U.S.-manufactured aeronautical products and are therefore in the public interest. Finally, all persons subject to the regulations will have the benefits heretofore accorded only by exemption but without the administrative burden and cost and time delays associated with seeking exemptions.

This amendment is in furtherance of the FAA's policy to avoid regulations which are unnecessary to its aviation safety mission.

Contrary to the expressed concern of one commentator, the revised procedures will not adversely affect safety. In this connection, it should be noted that issuance of export airworthiness approvals will be conditioned on full disclosure to the foreign airworthiness authority, and the written acquiescence of that authority to FAA requirements that are not met in any given situation. In this manner, the decision to accept products that do not meet all the U.S. export requirements will properly rest with the airworthiness authority of the importing country. Without approval of the importing country, a product not meeting the regulatory standards will not be issued an export airworthiness approval.

Another commentator expressed general agreement with the proposals. However, he suggested that proposed § 21.325 be changed to allow the export of unassembled rotorcraft of 12,500 pounds or less, maximum certificated takeoff weight, rather than limiting such exports to normal category rotorcraft. The commentator pointed to the export of unassembled fixed-wing aircraft of 12,500 pounds or less, and asserted that the assembly of any aircraft of that weight involves the same degree of complexity. The FAA disagrees. Current standards provide that normal category rotorcraft must weight 6,000 pounds or less while normal category airplanes may weigh up to 12,500 pounds. The complexity of an aircraft, and of its assembly, is dependent on more than weight alone. More important are the airworthiness requirements it must meet, a matter which is determined by the category into which the aircraft falls.

Finally, one commentator agreed with the proposals but suggested that § 21.339(a) also be amended to permit a special export certificate to be issued for the export of an aircraft with a restricted U.S. certificate of airworthiness. This comment is not directly related to any of the proposals contained in Notice 77–19; however, the FAA is currently evaluating a petition for rulemaking which makes a similar proposal. Accordingly, action on this matter is not being taken in conjunction with this rulemaking action.

ADOPTION OF THE AMENDMENT

Accordingly, Subpart L of Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended, effective April 16, 1979.

(Secs. 313(a), 601, 603, and 608, Federal Aviation Act of 1958, as amended (49 U.S.C. 1354(a), 1421, 1423, and 1428); Sec. 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21–49

Exhibition, Air-Racing, and Amateur-Built Aircraft: Airworthiness Certificate and Repairman Certification

Adopted: August 2, 1979 **Effective: September 10, 1979**

(Published in 44 FR 46778, August 9, 1979)

SUMMARY: These amendments provide for the issuance of experimental certificates for exhibition, air-racing, and amateur built aircraft for periods longer than one year and for repairman certification of the primary builders of these aircraft, who may then perform the required condition inspection on such aircraft. The purpose of these amendments is to reduce, without any derogation of safety, the burden on certain experimental aircraft owners associated with annual recertification by the FAA.

FOR FURTHER INFORMATION CONTACT:

Raymond E. Ramakis, Regulatory Project Branch, AVS–24, Safety Regulations Staff, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591; Telephone (202) 755–8716.

SUPPLEMENTARY INFORMATION:

BACKGROUND

These amendments to Parts 21 and 65 of the Federal Aviation Regulations (FAR) are based on a Notice of Proposed Rule Making (NPRM) issued as Notice 79–4 and published in the Federal Register on March 5, 1979 (44 FR 12042).

Notice 79–4 proposed to extend the duration of experimental certificates for aircraft certificated for the purpose of exhibition, air racing, or operating amateur-built aircraft for a period longer than one year. It also proposed that primary builders of these aircraft be eligible for repairman certification.

Interested persons have been afforded an opportunity to participate in the making of these amendments and due consideration has been given to all matter presented. Two hundred and twelve comments pertaining to the proposals were received and they are discussed below.

Present section 21.181(a)(3) provides that an experimental airworthiness certificate is effective for one year after the date of issuance or renewal, unless a shorter period is prescribed by the Administrator. Generally, this has meant that aircraft having experimental certificates are recertificated annually by FAA inspectors. This recertification process has included a condition inspection performed by the FAA.

A recent survey indicates that there are about 9,000 aircraft on the U.S. Registry certificated in the experimental category; approximately 7,000 of these are certificated for the purpose of exhibition, air racing, or operating an amateur-built aircraft. This large and ever-increasing number of experimental aircraft, particularly the amateur-built, has resulted in extended delays for many applicants seeking certification or recertification of their experimental aircraft.

Extending the duration of these experimental certificates will relieve this burden on aircraft owners by eliminating the annual recertification by the FAA. Experience with the present rule has shown that safety considerations do not require that FAA inspectors conduct the annual recertification inspection of such aircraft provided that they are inspected in a manner similar to aircraft certificated in a standard category. To ensure an adequate level of safety, the FAA will impose an operating limitation during certification requiring that, at least once a year, the aircraft receive a condition inspection in accordance with Appendix D of FAR Part 43 and be found to be in a safe condition, and that an entry recording that inspection be made in the aircraft's maintenance records.

These inspections will be able to be conducted by a certificated mechanic holding an airframe and powerplant rating (A & P mechanic) or an appropriately rated repair station. In addition, these amendments will further reduce the burden on some owners by providing for the repairman certification under Part 65 of certain aircraft builders. If a person qualifies for certification, that individual will be allowed to perform the condition inspection on the aircraft that person has built. The builder's certification as an airman is required to satisfy Section 610(a)(2) of the Federal Aviation Act of 1958 which makes it unlawful for any person to serve in any capacity as an airman without an airman certificate authorizing him to serve in this capacity.

These amendments are issued in accordance with Executive Order 12044 and the Department of Transportation's Regulatory Policies and Procedures which are intended to reduce the unnecessary burdens of regulation on the public.

DISCUSSION OF COMMENTS

A majority of the comments received in response to Notice 79–4 contained a recommendation that the duration of experimental certificates for amateur-built, exhibition, and air-racing aircraft be permanent or for an indefinite period. Other commenters suggested that the duration of the certificates be for the length of time the aircraft is owned by the builder while some others would specify a certain number of years. The FAA agrees that once the aircraft has been shown to pose no hazard to the general public it should be certificated for an unlimited time. Since most experimental aircraft do not conform to an FAA approved type design and must be subject to a trial period of operation, the initial period of certification must necessarily be of limited duration. The FAA certificating inspector must retain the latitude needed to establish the initial certification period based on personal inspection of the aircraft and data presented by the applicant. Thereafter, following the initial certification and successful operation within the assigned flight test area for a specified period of time, it is the FAA intent that amateur-built, air racing, and exhibition aircraft be given an experimental certificate of unlimited duration. The rule therefore provides that such aircraft will be certificated for an unlimited period unless the Administrator finds for good cause that a specific period should be established.

The FAA will monitor the safety record of the aircraft certificated under this new rule. Should it appear at any time in the future that certificates of specific duration are required in order to safeguard the general public, appropriate rule making action will be taken.

One commenter objected to the proposal on the ground that it was unsafe. His major concern was that the work on these aircraft be accomplished by an A & P mechanic or under his direct supervision. As an alternative to the proposal contained in Notice 79-4, the commenter suggested that the construction of experimental aircraft be under the craftsmanship or direct supervision of a certificated mechanic, and that a mechanic holding an inspection authorization rating reissue the experimental certificate at the time of the annual inspection which would be conducted by such an inspector. The FAA has had a long-time policy of encouraging assistance of qualified private persons during aircraft construction and believes that amateur-aircraft builders should continue to utilize those persons if the need arises. A delegation of authority for issuance of experimental certificates, however, is not warranted. The FAA wishes to retain the responsibility for certification, including a determination that the aircraft is in a condition for safe operation, and for prescribing appropriate operating limitations. With respect to the conduct of the annual recurring condition inspection, the FAA has concluded that an inspection by the original builder if he holds a repairman certificate, an A & P mechanic, or a repair station holding appropriate ratings can provide a satisfactory level of safety.

As suggested above, the FAA concurs with the suggestion of several commenters that appropriately rated repair stations be allowed to conduct the annual inspection. No additional rule change is required to implement this decision.

In order to increase the time available to FAA inspectors for other required functions, one commenter suggested that A & P mechanics perform the in-progress construction inspections. He also objected to the issuance of repairman certificates to "so-called aircraft builders," many of whom, he contended, do not build the aircraft and lack building and maintenance skills. It is during the in-progress inspection that FAA inspectors can concurrently inspect the aircraft and begin their assessment of the builder's skills and qualification for repairman certification. Only qualified builders will be certificated. Thus, it is important that the FAA maintain its inspection role during aircraft construction. This commenter's contention that the repairman certification process and repairman surveillance will be a drain on the FAA inspectors' time is rejected. As already noted, much of this one-time determination of qualification will be made during the construction.

One commenter suggested that A & P mechanics were not sufficiently qualified to make the required condition inspection of certain sophisticated aircraft, such as ex-military and jet aircraft, and suggested that a mechanic holding inspection authorization should be required in these cases. Another commenter suggested that certificated mechanics with inspection authorization be required in all cases. The FAA disagrees. The scope of the recurring condition inspection is the same as that required for a 100-hour inspection of standard category aircraft. Since A & P mechanics have long been permitted to conduct 100-hour inspections, there is no reason to doubt their ability to conduct this inspection of experimental aircraft. Furthermore, under § 65.81 a certificated mechanic may perform only the maintenance for which he is rated, and that only if he has satisfactorily performed the work concerned at an earlier date.

Several commenters objected to the issuance of a repairman certificate to the original builder of an amateur-built aircraft. The concern was that the builder may have no experience in the inspection or direction of conditions causing or leading to defects in the aircraft. They also stated that, for the most part, the amateur-aircraft builder lacks the facilities and equipment necessary to maintain the aircraft, and therefore the annual inspection should be conducted by an authorized inspector. Those original builders who obtain repairman certification will have demonstrated, to the satisfaction of the FAA, sufficient knowledge and skill to allow them to inspect the aircraft they have built. The concern over lack of facilities is not valid. Under the present rule, the FAA inspector conducts the recertification inspection, for the most part, using the same facilities and equipment available to the aircraft owner.

Another commenter objected on two grounds. First, he asserted that having built a part of the aircraft does not qualify a person to inspect all of that aircraft. For example, he noted that while a home-built constructor may actually have built only a part of the airframe, his repairman certificate would permit him to inspect a powerplant, electrical, or hydraulic component of which he may not have sufficient knowledge. In this connection the scope and detail of the Part 43, Appendix D, inspection does not require extensive knowledge of such systems. It should be noted that in the case of repair stations, one which has only an appropriate airframe rating may conduct the inspection. Second, he objected to the fact that the FAA was turning over much administrative work to the general public rather than to a professional member of the aviation community. In fact, as a result of the adoption of these amendments there should be less administrative work since there will be no need for the owner to make annual application for recertification.

One commenter objected to the proposal on the ground that its adoption will impose a financial burden on owners who are not the original builders. Additional cost will be required for condition inspections. However, it is the conclusion of the FAA, apparently supported by most commenters who support the proposal, that such cost will be more than offset by relief from the time delays associated with seeking recertification of their aircraft by the FAA and by the added flexibility made available for selecting the time and place of inspection.

In a related matter, several commenters suggested that the services of an FAA inspector be available to owners of amateur-built aircraft who are not the original builders when they are unable to secure inspection from a certificated A & P mechanic. In those cases where an owner can show inability to get an inspection, he may apply for the services of an FAA inspector. In addition an owner may also utilize an appropriately rated repair station to perform the required inspection.

Several commenters proposed that Experimental Aircraft Association designees be authorized to perform the condtiion inspection. As in the case of those owners who are not the original builders, the FAA would not have a standard by which to judge the knowledge and skills of these persons.

Two commenters suggested that persons who have constructed an aircraft from a kit should not be eligible for a repairman certificate. Furthermore, one of these commenters stated his belief that a repairman certificate should only be issued to a builder whose workmanship is of acceptable quality. It should be noted that according to Advisory Circulars 20-27B, dated April 20, 1972, and 20-28A, dated December 29, 1972, aircraft which are merely assembled from kits composed completely of prefabricated components and parts, and pre-cut pre-drilled materials, are not eligible for certification as amateur-built aircraft, since the major portion of the aircraft would not have been fabricated and assembled by the builder as is required by FAR § 21.191(g). Although there is not a specific quality of workmanship requirement for receiving a repairman certificate, this is implicit in requiring that a person demonstrate to the satisfaction of the Administrator the requisite skill to determine whether the aircraft is in a condition for safe operation.

Several commenters suggested that a repairman certificate be made available to all owners of amateur-built aircraft after they demonstrate the required level of knowledge and skill needed to maintain their aircraft. Extending repairman certification to all owners of amateur-built aircraft would be impractical because the FAA does not have a standard by which to judge the knowledge and skills of owners who have not built their aircraft. The FAA conducts inspections of amateur-built aircraft at various stages of their construction. In this way, the builder is able to demonstrate the knowledge and skills considered necessary for conducting an inspection and determining that the aircraft will be in a condition for safe operations.

Because this observation of the builder and his work is the essential means for determining a builder's knowledge and skill required for issuance of a repairman certificate, the FAA rejects the suggestion of one commenter that a written examination be required. If such an examination is considered necessary, it can be required by administrative means; a regulation is not required.

One commenter suggested that once issued a repairman certificate on the basis of having built an amateur-built aircraft, a person should be allowed to inspect other amateur-built aircraft. Another commenter stated that the condition inspection should be able to be performed by any amateur builder who had built an aircraft of the same type. The FAA cannot accept these suggestions. Although many amateur-built aircraft may be of similar type, they are not fabricated to a type design or specification and the builders frequently make changes based on personal desires or the availability of materials. These changes are often significant. Thus, the original builders may possess the expertise to inspect the aircraft they have built but not one built by another person or one of similar type.

Several commenters requested that the original builder of an amateur-built aircraft be allowed to continue to conduct the required inspection of the aircraft after its sale to a new owner, if the new owner so desired. Although the proposal did not address the situation directly, it was intended that the qualified original builder be allowed to continue to inspect the aircraft after its sale, at the request of the new owner.

Several commenters suggested a "grandfather" clause be applied to the issuance of repairman certificates to allow present amateur-built aircraft owners who are not the builders of the aircraft to be eligible for a repairman certificate. These commenters believe that since they have been performing their own maintenance and repairs under the present rule they should be qualified to perform the annual condition inspection under the new rule. A "grandfather" clause for amateur-built owners who are not the builders is not warranted. The nonbuilders do not have the privilege of performing the annual condition inspection under the present rule; therefore, they cannot be "grandfathered" to perform it under the new rule. As previously stated, the original builders are the ones who most likely will possess the expertise to inspect the aircraft they have built. To issue repairman certificates to amateur-built aircraft owners who are not the builders on the basis of their performing maintenance would require that the FAA issue repairman certificates to the present owners of exhibition and air-racing aircraft for the same reason. This would not be in the interest of safety.

One commenter proposed that the original builder be allowed to sign-off the recurring inspection and repairs performed by subsequent owners. As stated above, it is not in the interest of safety to allow nonbuilders to conduct the required inspection. Furthermore, while the FAA recognizes that qualified original builders have sufficient expertise to perform the inspection, it does not necessarily follow that they are sufficiently qualified to approve or disapprove another person's maintenance.

Several commenters proposed deletion of the citizenship requirement to be eligible for a repairman certificate. One of the commenters is a Canadian citizen who was admitted to the U.S. as a permanent resident and now holds an FAA Repairman Certificate. It is also noted that Section 501(b) of the Federal Aviation Act of 1958 was recently amended to allow an individual citizen of a foreign country who has been admitted to the United States as a permanent resident to register aircraft. Therefore, proposed section 65.104(a)(4) is revised to provide for the issuance of a repairman certificate to an individual citizen of a foreign country who has lawfully been admitted for permanent residence in the United States.

Two commenters suggested an annual inspection certificate be executed by the person performing the condition inspection. The original certificate would be contained in the logbook with a copy sent to the local district office. An annual inspection certificate is not deemed necessary. The amendment provides for the FAA to impose operating limitations requiring the condition inspection to be recorded in the aircraft's maintenance records. In the case of standard category aircraft, no certificate is issued. An entry is made in the maintenance records. This should be sufficient for experimental aircraft. However, in line with these comments, the FAA does make available an annual inspection reminder. This reminder is a decal which is secured in a conspicuous area in the aircraft and reminds the operator of the next inspection date.

One commenter suggested that the FAA perform spot checks to ensure the quality of maintenance and condition inspections of these experimental aircraft. This is an ongoing function of the FAA as to all aircraft and such surveillance will continue.

Several commenters suggested revising the applicability of Part 43 to include experimental aircraft and to require that they be inspected in accordance with Part 91. Applying such restrictions would be contrary to the intent of the amateur-built aircraft program, which is fabricating and assembling an aircraft for educational or recreational purposes. In addition, many exhibit and air-racing aircraft are ex-military aircraft and applying Parts 43 and 91 to them would be excessively restricted on their owners.

One commenter expressed his belief that an advisory circular giving inspection guidelines is needed. While advisory material is going to be release concerning these amendments, no inspection guidelines advisory circular is planned. Appendix D of FAR Part 43 is considered to be adequate.

One commenter suggested that an airworthiness certificate be renewed by an FAA inspector or a certificated mechanic holding an inspection authorization if there is a lapse in the recurring condition inspections to prevent the sale of an unsafe aircraft to an unsuspecting person. Such a provision in the regulation is not needed. The operating limitations will not permit flight of an aircraft unless during the previous twelve months it has been inspected and found to be in safe condition.

Several commenters suggested that the repairman certificate be issued only after the aircraft has flown off its initial restriction. While it is anticipated that the certificates will be issued at this time, such a decision is being retained as a matter for policy determination. One commenter also wanted to require that the owner be in possession of the applicable service manuals and plans before repairman certification. Since some amateur-built aircraft do not even have plans, such a regulation is not considered appropriate.

Two commenters made proposals, neither of which is related to the rule changes proposed in Notice 79-4. One suggested that an experimental certificate be converted to a standard airworthiness certificate after a specified period or satisfactory operation and inspection. The FAA cannot accept this proposal. Standard category airworthiness certificates are issued only after an exacting and detailed finding that the design meets specific regulatory requirements. The mere operation of an experimental aircraft with limited inspections falls far short of the detailed compliance findings required for issuance of a standard airworthiness certificate.

The other commenter proposed to amend § 21.191 to permit the issuance of experimental certificates for the purpose of operating certain nonstandard aircraft for recreation. A similar proposal by that commenter in the form of a petition for rule making has already been denied.

ADOPTION OF THE AMENDMENT

Accordingly, Parts 21 and 65 of the Federal Aviation Regulations (14 CFR Parts 21 and 65), are amended effective September 10, 1979.

(Sections 313(a), 601, and 602 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1422; sec. 6(c) of the Department of Transportation Act 49 U.S.C. 1655(c)).

NOTE.—The Federal Aviation Administration has determined that this document involves a regulation which is not considered to be significant under the procedures and criteria prescribed by Executive Order 12044 as implemented by Department of Transportation Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). A copy of the Final Regulatory Evaluation is filed in the Public Docket.

Copies of this evaluation may be requested from Raymond E. Ramakis, Regulatory Projects Branch, AVS-24, Safety Regulations Staff, Federal Aviation Administration, 800 Independence Ave., S.W., Washington, D.C. 20591; Telephone (202) 755-8716.

Amendment 21-50

Technical Standard Order (TSO) Revision Program

Adopted: June 2, 1980 **Effective: September 9, 1980**

(Published in 45 FR 38342, June 9, 1980)

SUMMARY: The purpose of these amendments is to adopt a new public procedure to expedite the issuance of standards, known as Technical Standard Orders (TSO), for specified materials, parts, processes, and appliances used on civil aircraft. In accordance with Executive Order 12044, Improving Government Regulations, the new procedure will expedite TSO issuance and amendment, and will result in the substantial reduction of existing regulatory material. Consistent with the President's goal of reforming the regulatory process to eliminate unnecessary requirements, these amendments will enable the FAA to issue and amend TSO's in a timely manner. In addition, it is part of the FAA's continuing effort to simplify the Federal Aviation Regulations. The expeditious issuance of new TSO's and amendment of existing TSO's (presently published as Subpart B of Part 37) are necessary to stay current with the continuing growth and technological advances in aeronautics.

FOR FURTHER INFORMATION CONTACT:

Mr. Eli S. Newberger, Regulatory Projects Branch, AVS-24
Safety Regulations Staff
Associate Administrator for Aviation Standards
Federal Aviation Administration
800 Independence Avenue, S.W.
Washington, D.C. 20591; Telephone (202) 755-8716.

SUPPLEMENTARY INFORMATION:

BACKGROUND

Whenever a material, part, process, or appliance is to be used on an aircraft, it must be approved under the Federal Aviation Regulations (FAR) before it can be utilized. The approval can be obtained in one of the following ways: (1) under a Parts Manufacturer Approval issued under 14 CFR 21.303; (2) in conjunction with type certification procedures for a product, including approvals granted by a supplemental type certificate; (3) under a Technical Standard Order authorization or approval issued under 14 CFR Part 37; or (4) in any other manner approved by the Administrator.

One of the several methods of obtaining approval is by designing and testing the article (material, part, process, or appliance) in accordance with a TSO which contains minimum performance and quality control standards for specified articles. The standards for each TSO are those the Administrator finds necessary to ensure that the article concerned will operate satisfactorily. Since compliance with a TSO is only one method of obtaining an approval, the standards contained in the TSO are not mandatory but are only an optional way of obtaining approval for a particular article. For example, an applicant can obtain approval to deviate from a particular TSO if it shows that the design features provide an equivalent level of safety.

A TSO is not a standard of general or particular applicability designed to implement or prescribe law or policy. It does not fall within the definition of "rule" contained in the Administrative Procedure Act (5 U.S.C. 551). There is no requirement that a TSO be published as a notice of proposed rule making in the *Federal Register*.

Future TSO's will, through incorporation by reference, make maximum practical use of "voluntary standards" as defined by the Office of Management and Budget (OMB) Circular A-119, "Federal Participation in the Development and Use of Voluntary Standards," issued January 17, 1980 (45 FR 4326). By definition of OMB Circular A-119, "voluntary standards" are established generally by the private sector "voluntary standards bodies" and are available for use by any person or organization, private or government. The term includes what are commonly referred to as "industry standards" as well as "consensus standards" but does not include professional standards of personal conduct, private standards of individual firms, or standards mandated by law. "Voluntary standards bodies" are nongovernmental bodies which are broad based, multimember, domestic, and multinational organizations including, for example, nonprofit organizations, industry associations, and professional technical societies which develop, establish, or coordinate voluntary standards.

The FAA has determined, for the reasons stated in Notice 79-15, published in the *Federal Register* on October 1, 1979 (44 FR 56370), that, in the interest of safety, it is appropriate to adopt new public procedures to facilitate the issuance of TSO's for specified articles used on civil aircraft. The safety aspect of this rule making is particularly important. The fact that TSO's have been part of the complex regulatory structure of the FAA has caused a substantial lag time between regulations and state of the technology. This procedural change should advance by months and even years the implementation of technological improvements in the U.S. aviation system.

Interested persons have been afforded an opportunity to participate in the making of these amendments, and due consideration has been given to all matters presented. Significant comments received in response to Notice 79-15 are discussed below. A number of substantive, editorial, and clarifying changes have been made to the proposed rules based on relevant comments and on further review within the FAA. Except for minor editorial and clarifying changes and the changes discussed below, these amendments and the reasons for their adoption are the same as those contained in Notice 79-15.

These amendments are consistent with the agency's responsibility to review the continuing need for regulations and the need to eliminate unnecessary regulations. By eliminating TSO's from the regulations, previously published as Subpart B of 14 CFR Part 37, and making them available through the multiple procedures described below, the FAA has improved the availability of the TSO's and made it easier for the public to locate the most up-to-date standard. In addition, by removing TSO's from the agency's regulatory process, the time available for other matters within the regulatory system will be increased. This will enable the agency to respond in a more timely manner to other issues submitted by the public. This improvement of the regulatory process, to be more responsive to the public, is consistent with Executive Order 12044, issued by President Carter on March 23, 1978.

DISCUSSION OF COMMENTS

Twenty-two individual sets of public comments were submitted in response to Notice 79-15. Several of the commenters were associations that presented the views of manufacturers, operators, and pilots. While the great majority of the commenters were in general agreement with the objective of the proposal, a number of them suggested changes, requested clarification or guidance, and offered specific criticisms. Other commenters proposed changes that are beyond the scope of this rule making.

DISCUSSION OF COMMENTS TO THE NEW PUBLIC PROCEDURE

In general, the commenters concerned themselves with the following questions: How would TSO authorizations be obtained? Would foreign countries accept them? How would a request for approval to deviate from any performance standard be handled? How would an interested party request a revision to a TSO? How would a current TSO be affected when a revision to the TSO is made? How would the public comment on a draft TSO? How would the FAA revise the sections of the Federal Aviation Regulations which reference a TSO by TSO number? One commenter expressed concern that adopting the proposal would abolish existing TSO's.

Based on comments received, the FAA has determined that the proposed new public procedure may not have been fully understood as it was explained in Notice 79-15. The purpose of the new public procedure is to expedite the issuance of TSO's for specified articles used on civil aircraft by deleting unnecessary rulemaking steps and by deleting unnecessary material from the regulations. This effort is consistent with Executive Order 12044. There is no change in the requirements for the issuance of TSO authorizations which are relocated from Subpart A of Part 37 to new Subpart O of Part 21. There is no change in the procedure to issue TSO authorizations, to process requests for approval to deviate from any performance standard, or to request a revision to a TSO. Existing holders of TSO authorizations will continue to retain their current status when new or amended TSO's are issued, unless otherwise specified in the TSO. Manufacturers may request approval to deviate from any TSO using the same procedures as before, now described in new § 21.609.

The new public procedure does not affect the right of the public to comment on a proposed TSO. The public will continue to be invited to participate in the development of documents prepared and issued by industry organizations which the FAA will use by reference in a TSO. The FAA will use the rulemaking process to revise the sections of the Federal Aviation Regulations which reference a TSO by TSO number when there is a need to change the referenced TSO number. The FAA will make available to any interested person an index of each current TSO and each TSO the FAA anticipates will be issued within the succeeding 12 months. The FAA will also invite comments from interested persons on each proposed TSO using a notice in the *Federal Register*.

PUBLIC PROCEDURE

The following is the public procedure, in detail, the FAA will use to develop and issue final TSO's for specified articles used on civil aircraft:

- The FAA will continue to develop draft TSO's and will continue to use, by reference in the TSO, documents prepared and issued by organizations such as the Radio Technical Commission for Aeronautics (RTCA) and the Society of Automotive Engineers (SAE). Notices of RTCA meetings and invitations will continue to be published in the *Federal Register*. This will allow public participation at the early stages of document development.
- Any interested person may request the Administrator to revise or issue a new TSO by submitting a description of the revision sought or a description of the new article for which a TSO is requested.
- The FAA will use several methods to ensure that the public is afforded early opportunities to take part in the TSO decisionmaking process. A draft TSO will be circulated for public comment through the use of mailing lists. Any individual or organization can request to be placed on the TSO mailing list. All those on the list will receive drafts of each TSO. In addition, Advisory Circular 20-110, Index of Aviation Technical Standard Orders, will list those TSO's the FAA anticipates will be issued within the succeeding 12 months. Advisory Circular 20-110 will also list each current TSO and provide information on how to obtain copies of those desired. Finally, the FAA will publish periodically a notice in the *Federal Register* of each proposed TSO and provide notice of how to obtain a copy.
- Any individual or organization wishing to obtain copies of Advisory Circular 20-110, specific draft TSO's, or all such TSO's proposed by the FAA may be placed on a mailing list by submitting a request addressed to the Federal Aviation Administration, Office of Airworthiness, Aircraft Engineering Division, Systems Branch (AWS-130), 800 Independence Avenue, S.W., Washington, D.C. 20591, or by telephoning (202) 426-8395. Interested persons will receive copies of the Advisory Circular and copies of those draft TSO's requested. Any person wishing to submit comments on a proposed TSO will be given 90 days from its issuance date to submit comments.
- All comments received on or before the closing date for comments will be considered by the Administrator before issuing a final TSO.
- All comments submitted will be available, both before and after the closing date for comments, for examination by interested persons in Room 335, FAA Headquarters Building (FOB-10A), 800 Independence Avenue, S.W., Washington, D.C. 20591, between 8:30 a.m. and 5:00 p.m.
- Copies of the final TSO will be mailed to all persons on the mailing list. As in the past, documents prepared and issued by an organization that are incorporated by reference in the TSO will continue to be available to any interested person only from that organization. Final TSO's will not be published in the *Federal Register*.

- Copies of all draft and final TSO's will also be available at FAA Headquarters in the Office if Airworthiness, Aircraft Engineering Division, Systems Branch (AWS-130), and at all regional Flight Standards Engineering and Manufacturing offices.

In summary, the new procedure has numerous opportunities for the public to participate in the development of each TSO. These are: (1) participation in the development of documents prepared and issued by industry organizations, which the FAA may use by reference in a TSO; (2) mailing lists to circulate a draft TSO to the public for comment; (3) an advisory circular to list for the public each TSO the FAA anticipates will be issued within the succeeding 12 months; (4) notice in the *Federal Register* announcing the availability of each draft TSO and invitation for comment; and (5) at least 90 days to submit comments.

DISCUSSION OF GENERAL COMMENTS

One commenter recommended tightening the TSO requirements, citing three airplane incidents (the loss of a piece of tail, the loss of a wing flap, and the failure of a rear bulkhead). This amendment does not address the requirements of any individual TSO. Furthermore, TSO authorizations are not issued for the airframe parts that the commenter cited. FAA approval for these airframe parts is accomplished under the type design approval for the specific airplane.

One commenter cited TSO references in §§ 91.24(a), 91.52, and 121.360 and questioned if the FAA plans to revise these sections to delete the referenced TSO. The FAA is not revising the referenced TSO in these sections. Since Part 37 is being revoked by this amendment, references to TSO's using sections of Part 37 (§ 37.XXX) are revised to reference each TSO by the TSO number.

One commenter stated that there may be problems relating to the enforcement of the provisions of Advisory Circular 20-110 under proposed §§ 21.603(a), 21.607(a), 21.609, and 21.611. It is unclear to what this commenter is referring since the advisory circular merely lists each current TSO and each TSO the FAA anticipates will be issued within the succeeding 12 months.

DISCUSSION OF COMMENTS TO § 11.49(b)

Present § 11.49(b)(2) delegates authority to the Director, Flight Standards Service, to issue, amend, and repeal TSO's under Part 37. The notice proposed deletion of this delegation since Part 37 is being revoked. No unfavorable comments were received on the proposal. Accordingly, the proposal is adopted without change. However, it should be noted that the current FAA official responsible for TSO's is the Director of Airworthiness.

DISCUSSION OF COMMENTS TO § 21.3

Two commenters pointed out that § 21.3 contained most of the requirements of proposed § 21.617 and suggested deleting requirements in proposed § 21.617 that are duplicated in § 21.3. The FAA agrees and comments to proposed § 21.617 are discussed under § 21.3. Section 21.617 adopted by this amendment relates to a different subject than that of proposed § 21.617 which is discussed under § 21.617.

One commenter suggested revising proposed § 21.617(a) and (b) to require mechanical reliability reporting of TSO articles (currently required for Parts 121, 127, and 135 operators) for Part 91 operators or owners. The commenters cited greater user awareness of such problems for justification. Because the FAA is currently reviewing the entire mechanical reliability reporting program and the issue will be addressed at a later date, the suggestion was not adopted.

Another commenter asked if imported articles would be exempt from the reporting requirements of proposed § 21.617. Section 21.3(d)(2) does exempt foreign manufacturers from the reporting requirements of § 21.3(a) because there are existing means by which the FAA obtains the necessary information from the appropriate airworthiness authorities in the country of manufacture. As a result of the information provided by the foreign authorities, it is not necessary to apply the requirements of § 21.3(a) to foreign manufacturers.

Another commenter suggested removing the phrase "After January 3, 1971" from proposed § 21.617(a) and (b). Based on these comments and upon further consideration, the FAA has amended § 21.3(a), (b), (d), and (e)(3)(ii) to make them applicable to holders of a TSO authorization, relocated proposed § 21.617(f) to new § 21.3(f), deleted the phrase "After January 3, 1971," from § 21.3(a) and (b), and deleted proposed § 21.617.

DISCUSSION OF COMMENTS TO SUBPART O OF PART 21

No unfavorable comments were received on the proposal to amend § 21.305(b) or on proposed §§ 21.609, 21.611, 21.613, 21.615, 21.619, and 21.621. Accordingly, these proposals are adopted without substantive change.

One commenter suggested deleting § 21.305(d) and amending § 43.7 to specify that any alteration or major repair approvals granted under Part 43 be limited to the specific aircraft (by type and serial number) upon which work is performed. The commenter stated that the provisions of § 21.305(d) in conjunction with discretionary functions of § 43.7 would "administratively lead to arbitrary and capricious application of subjective standards." No proposal was made in Notice 79–15 to amend §§ 21.305(d) and 43.7 as suggested by the commenter. Furthermore, since the FAA does not have sufficient information at the present time to justify such amendments to §§ 21.305(d) and 43.7, the suggestion is not adopted.

One commenter suggested placing the TSO procedural requirements under Subpart K instead of proposed Subpart O and questioned the need for the proposed new Subpart O. Relocation of the procedural requirements of Subpart A of Part 37 in new Subpart O, as proposed, would retain the same paragraph format subdivisions which are easy to read and use. This would make the regulations easier to use for all members of the public. Therefore, these requirements are relocated in Subpart O.

One commenter suggested that TSO authorizations be transferable. The FAA does not agree. TSO authorizations are not transferable like type certificates because authorizations are issued based on the person's quality control system and ability to duplicate the article under the TSO system.

§ 21.601

No unfavorable comments were received on proposed § 21.601. However, the FAA is adopting an amendment to § 21.601 by adding paragraph 21.601(c) which states that the Administrator does not issue a TSO authorization if the manufacturing facilities for the product are located outside of the United States, unless the Administrator finds that the location places no undue burden on the FAA in administering applicable airworthiness requirements. This additional requirement is necessary to ensure that proper surveillance can be maintained over the manufacturer's facilities. The need to impose this restriction is based upon the type of surveillance necessary over a manufacturer having a TSO authorization. It is identical to the restriction placed upon manufacturing facilities to which type certificates are issued in accordance with § 21.43 and to which production certificates are issued in accordance with § 21.137 and reflects current practice. A new § 21.617 is adopted to address current practices for approving foreign-manufactured articles designed to TSO performance standards. The procedures of new § 21.617 provide an equivalent to the domestic TSO authorization.

§ 21.603

One commenter objected to proposed § 21.603(b) which continues to allow the holder of an FAA letter of acceptance of a statement of conformance, issued for an article before July 1, 1962, to continue to manufacture that article without obtaining a TSO authorization. The commenter stated that this establishes different levels of safety for the same product because it allows a product to continue to be manufactured under obsolete standards when that product could not meet current standards. Holders of such letters must comply with the requirements of §§ 21.607 through 21.615, 21.619, and 21.621. In general, when an application for TSO authorization is made, the applicable standards for the article are those in effect on the date of application. The FAA did not propose to revise § 21.603(b) to withdraw letters of acceptance issued before July 1, 1962, or any TSO authorization issued after July 1, 1962, and to require all manufacturers to demonstrate compliance with the current TSO performance standards. No unfavorable comments were received on the proposal to relocate the substance of § 37.3 to new § 21.603. Accordingly, the proposal is adopted without substantive change.

§ 21.605

One commenter recommended revising proposed § 21.605 (a)(2) to require one copy of the technical data required in the applicable TSO issued by the Administrator unless additional copies are requested by the Administrator. The FAA agrees this would reduce the number of copies of the technical data the applicant would need to submit. Another commenter suggested revising the last sentence of proposed § 21.605(a)(3) to add the phrase "or numbers (or combinations thereof)" between the words "letters" and "will." The commenter stated this would allow the use of suffix numerals as well as letters to designate minor changes to TSO articles. The FAA agrees. After further review, the FAA has determined that the use of part numbers in proposed §§ 21.605(a)(3) and 21.611(a) to identify minor design changes would simplify and expedite approval of such changes. This is consistent with Executive Order 12044 in that it lessens the regulatory burden on the public. Accordingly, § 21.605 is adopted with the noted changes.

§ 21.607

One commenter suggested deleting proposed § 21.607(d)(3) because the required weight information is not necessary as a part of the nameplate and it is provided elsewhere. The FAA agrees. Section 21.607(d)(3) is deleted and § 21.607(d) is renumbered. The same commenter recommended amending proposed § 21.607 to list the required data and information currently listed in the performance standards of each TSO to further simplify the TSO system. The FAA has determined that since the data and information listed in each TSO are not common to all TSO's, the recommendation, if adopted, would impose unnecessary requirements on some TSO authorization holders. Accordingly, proposed § 21.607 is adopted without substantive change.

Issue of Letters of TSO Design Approval: Import Appliances

New § 21.617

In order to implement the requirements contained in §§ 21.601(b)(2), 21.603(d) and 21.609(b), the FAA is adopting procedural requirements which reflect current practice for the issuance of letters of TSO design approval for import appliances (see discussion of § 21.601). New § 21.617, which is totally different in subject from proposed § 21.617 (see § 21.3), prescribes the procedural requirements and, as adopted, §§ 21.601(b)(3), 21.603(a), and 21.609(b) are revised to address foreign manufacturers. These procedural requirements reflect the current practice. Adopting this procedure causes no burden on any person and it has the benefit of formalizing the current practice. The FAA finds that notice and public procedure are unnecessary.

NOTE: This rule contains provisions for the issuance of a TSO authorization and a letter of TSO design approval. To differentiate, a TSO authorization is limited to manufacturers of articles (materials, parts, processes, or appliances) located in the United States. These manufacturers must comply with the requirement to submit quality control system data in addition to certifying that their design complies with the pertinent TSO. Conversely, a letter of TSO design approval is processed under the provisions of airworthiness bilateral agreements and is limited to appliances as defined in pertinent airworthiness bilateral agreements. Such approvals do not require submitting quality control data. The quality control integrity of these appliances is attested to by the Certificate of Airworthiness for Export issued by the civil airworthiness authority of the country of manufacture under the provisions of § 21.502.

NOTE: Any article approved under an FAA TSO authorization (domestic) or under a letter of TSO design approval (foreign) only attests to the conformity of the design and quality of the particular article against the TSO performance and quality control standards. It does not convey an installation approval. Accordingly, installation approval must be obtained in a manner acceptable to the Administrator for each particular product on which the article is to be installed. This is not a change in existing practice.

DISCUSSION OF COMMENTS TO PART 37

One commenter suggested revoking only Subpart B of Part 37. The FAA has determined that there is benefit in having all of the certification procedures for products and parts in Part 21 of the Federal Aviation Regulations. Accordingly, the proposal to revoke Part 37 is adopted without change.

NOTE: There is no change in reporting and/or recordkeeping requirements which are relocated from Subpart A of Part 37 to new Subpart O of Part 21.

ADOPTION OF THE AMENDMENTS

Accordingly, Parts 11, 21, 25, 29, 37, 91, 121, 127, and 135 of the Federal Aviation Regulations (14 CFR Parts 11, 21, 25, 29, 37, 91, 121, 127, and 135) are amended, effective September 9, 1980.

(Sections 303(d), 313(a), 601, 603, and 605, Federal Aviation Act of 1958, as amended (49 U.S.C. 1344, 1354(a), 1421, 1423, 1424, and 1425; Section 6(c), Department of Transportation Act (49 U.S.C. 1655(c)).)

NOTE: The FAA has determined that this document involves regulations which are not considered to be significant under the procedures and criteria prescribed by Executive Order 12044 and as implemented by the Department of Transportation Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). A copy of the final evaluation prepared for this action is contained in the regulatory docket. A copy of it may be obtained by contacting the person identified under the caption "FOR FURTHER INFORMATION CONTACT."

Amendment 21-51

Airworthiness Review Program—Amendment No. 8A: Aircraft, Engine, and Propeller Airworthiness, and Procedural Amendments

Adopted: August 27, 1980 **Effective: October 14, 1980**

(Published in 45 FR 60154, September 11, 1980)

SUMMARY: These amendments to the Federal Aviation Regulations update and improve the airworthiness standards applicable to the type certification of aircraft, engines, propellers, related operating rules, and procedural requirements. These amendments are part of the Airworthiness Review Program.

FOR FURTHER INFORMATION CONTACT:

Marvin J. Walker, Regulatory Review Branch, AVS-22
Safety Regulations Staff
Associate Administrator for Aviation Standards
Federal Aviation Administration
800 Independence Avenue, SW
Washington, D.C. 20591
Telephone: (202) 755-8714

SUPPLEMENTARY INFORMATION:

These amendments are the ninth and last in a series of amendments issued as part of the Airworthiness Review Program. The following amendments have previously been issued as part of this program:

Title and FEDERAL REGISTER (FR) Citation

Amendment No. 1: Form Number and Clarifying Revisions (40 FR 2576; Jan. 14, 1975)
Amendment No. 2: Rotorcraft Anticollision Light Standards (41 FR 5290; Feb. 5, 1976)
Amendment No. 3: Miscellaneous Amendments (41 FR 55454; Dec. 20, 1976)
Amendment No. 4: Powerplant Amendments (42 FR 15034; March 17, 1977)
Amendment No. 5: Equipment and Systems Amendments (42 FR 36960; July 18, 1977)
Amendment No. 6: Flight Amendments (43 FR 2302; Jan. 16, 1978)
Amendment No. 7: Airframe Amendments (43 FR 50578; Oct. 30, 1978)
Amendment No. 8: Cabin Safety and Flight Attendant Amendments (45 FR 7750; Feb. 4, 1980)

These amendments are for the most part based on Notice 75-31 which was published in the FEDERAL REGISTER on July 11, 1975 (40 FR 29410), as well as a number of proposals contained in the following notices of proposed rule making: Notice 75-10 (40 FR 10802; March 7, 1975); Notice 75-19 (40 FR 21866; May 19, 1975); and Notice 75-26 (40 FR 24802; June 10, 1975). Amendments based on the latter three notices have already been issued as a part of the Airworthiness Review Program, specifically those titled Miscellaneous Amendments, Powerplant Amendments, and Airframe Amendments, respectively. Final action on certain of the proposals was deferred, however, at the time the amendments were issued as further consideration and review of these proposals was considered necessary. In other cases, final action was deferred so that they could be considered together with related proposals contained in other notices.

Certain proposals identified as Group 2 in Appendix I to Notice 75-31 were deferred to be dealt with in a later notice as a part of the Airworthiness Review Program. These proposals all addressed the concept of periodically updating the certification basis of airplane models in long-term production. Such recertification every five or ten years would be intended to ensure that the level of safety of all airplanes in service keep pace with the current level of safety expectations. The FAA has now determined that these proposals more appropriately should be examined as a separate issue in a future regulatory action. Accordingly, the proposals identified as Group 2 in Appendix 1 to Notice 75-31 are being dropped from the Airworthiness Review Program.

Proposals relating to cabin safety and flight attendants, which are identified in this amendment, were extracted from Notice 75-31 (40 FR 29410; July 11, 1975) and handled on an expedited basis. Those rules were published in the Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Interested persons have been given an opportunity to participate in the making of these amendments and due consideration has been given to all matters presented. The proposals and comments are discussed below. Substantive changes and changes of an editorial and clarifying nature have been made to the proposed rules based upon relevant comments received and further review within the FAA. Except for minor editorial and clarifying changes and the substantive changes discussed below, these amendments and the reasons for them are the same as those contained in Notices 75-10, 75-19, 75-26, and 75-31.

DISCUSSION OF COMMENTS

The following discussions are keyed to the like-numbered proposals contained in Notices 75-10, 75-19, 75-26, and 75-31, and are presented in the same order as the corresponding amendments found in the rules portion of this document.

Proposal 8-1. The proposal to amend § 1.1 in order to transfer the definitions for rated power and thrust to a new § 33.6 is withdrawn. It is considered that such a change may introduce confusion in the administration of aircraft certification rules. See also Proposal 8-94.

Proposal 8-2. Several commenters object to proposed § 21.16(a) which would delete reference to a "novel and unusual design feature" as a necessary condition for the Administrator to issue special conditions. Special conditions become a part of the designated applicable regulations for type certification of a particular product (aircraft, aircraft engine, or propeller).

One commenter indicates that the proposed revision is unjustified and would lead to indiscriminate rule making, and that instead of simplifying the administration of the requirements it would introduce complexity. Another commenter claims that adoption of proposed § 21.16(a) would introduce uncertainty into design requirements.

One commenter suggests that in lieu of revising § 21.16, the FAA should perform a study of § 21.21(b) (2). (Section 21.21(b) (2) provides for denial of a type certificate if an unsafe feature or characteristic exists in the design under consideration. Before adoption of § 21.16, FAA used § 21.21(b) (2) to issue special conditions in letter form.) This commenter suggests that if § 21.21(b) (2) were to continue to be used to issue special conditions to cover an unsafe design feature or characteristic that is not "novel or unusual," it must be equally applicable to a condition that exists on more than one (earlier certificated) product, further stating that the other product or products must then have been type certificated using existing rules which did not adequately cover the unsafe design feature or characteristic. On this premise, the same commenter asks several relevant questions. When § 21.21(b) (2) is applied, does the FAA make it retroactive to the other involved models? Are Airworthiness Directives (Part 39) issued? Why wasn't a special condition issued against the first applicant when the condition was, in fact, novel or unusual? Why was this not followed by a notice of proposed rule making for future application?

These comments and questions caused the FAA to completely reevaluate its practices in designating the applicable regulations for type certification under § 21.17(a), commonly referred to as defining a "type certification basis."

After further consideration of the comments received as well as FAA practice in designating the applicable regulations, and the objectives of proposed § 21.16, the FAA agrees that this proposal should be withdrawn because of the potential for possible abuse of general rulemaking procedures, of the requirements of the Administrative Procedure Act, and the intent of Executive Order 12044. As explained below, the objectives of proposed § 21.16 will be satisfied by the application of a new FAA policy affecting the designation of applicable regulations for the type certification of new aircraft, aircraft engines, and propeller designs. These future practices are consistent with the FAA General Rule-Making Procedures of Part 11, the Administrative Procedure Act, and Executive Order 12044.

Section 21.16 is one paragraph of a number of paragraphs used to define the type certification basis of a new product. Companion paragraphs of importance to this discussion include §§ 21.17 and 21.21. Section 21.17(a) provides that the applicable airworthiness standards are (1) those requirements of this subchapter that are effective on the date of application for a type certificate, unless otherwise specified by the Administrator or unless compliance with later effective amendments is elected by the applicant or required by special retroactive regulations (e.g., § 25.2), and (2) any special conditions prescribed by the Administrator in accordance with § 21.16. Section 21.16 provides for the issuance of special conditions when the Administrator finds that the existing airworthiness standards do not contain adequate or appropriate safety standards *because of novel or unusual design features* of the product to be type certificated. Section 21.21(b) (1) permits noncompliance with specific provisions of the airworthiness standards when there are compensating factors that provide an equivalent level of safety. Such determinations are commonly referred to as "equivalent safety findings." Section 21.21(b) (2) provides for the denial of a type certificate, notwithstanding a showing of compliance with the applicable airworthiness standards designated in accordance with § 21.17, if the Administrator finds an unsafe feature or characteristic of the product for the category in which certification is requested.

Sections 21.16, 21.17, and 21.21, taken together with FAA policy in designating the applicable regulations must recognize and balance four important considerations: (1) the FAA has an obligation under Section 601 of the Federal Aviation Act of 1958 to keep the airworthiness standards of this subchapter (i.e., FARs 23, 25, 27, 29, 31, 33, and 35) as current as practicable; (2) the type certificate applicant has a right and a need to know, in very specific terms, what the applicable airworthiness standards will be in order to finalize the detail design of its product and to enable the applicant to make reasonable performance guarantees to its potential customers; (3) in the interests of safety, rapid technological advances presently being made by the civil aircraft industry require that the FAA be able to issue special conditions to address truly novel or unusual design features that it has, as yet, not had an adequate opportunity to envisage in the airworthiness standards through the general rulemaking process; and (4) because the airworthiness standards of this subchapter are intentionally objective in nature to allow flexibility in design, the FAA must retain the prerogatives both to make equivalent safety findings and to deny a type certificate whenever an unsafe design feature or characteristic is found during the type certification process.

The phrase "novel or unusual" as used in § 21.16 is a very relative term. As used hereafter in applying § 21.16 to justify the issuance of special conditions, "novel or unusual" will be taken with respect to the state of technology envisaged by the applicable airworthiness standards of this subchapter. It must be recognized that in some areas which will vary from time to time the state of the regulations may somewhat lag the state of the art in new design because of the rapidity in which the state of the art is advancing in civil aeronautical design and because of the time required to develop the experience base needed by the FAA to proceed with general rule making. Applicants for type certification of a new design have the opportunity to mitigate the impact of not knowing the precise airworthiness standards to be applied for "novel or unusual design features" by consulting with the FAA early in their certification planning when such features are suspected or known by the applicant to exist. It should also be recognized that, because of the intentional objective nature of the airworthiness standards of this subchapter, many new design features which might be thought of as "novel or unusual design features" may already be adequately covered by existing regulations, thus obviating the need to issue special conditions.

Henceforth, the special condition will not be issued for general upgrading of the applicable airworthiness standards when novel or unusual design features are not involved. Whenever the FAA determines that an upgrading of the airworthiness standards of this subchapter is warranted, the upgrading will be promulgated as an amendment to this subchapter consistent with the general rulemaking procedures of FAR Part 11, the Administrative Procedure Act, and Executive Order 12044. Should the FAA conclude that there is a compelling safety need to apply a proposed amendment retroactively to designs already type certificated or to designs for which a type certificate application is in progress, the retroactive aspects of the proposed amendment, if supportable by a regulatory analysis completed in accordance with Executive Order 12044, will be announced in the notice or proposed rule making for that amendment. Public comments on the proposed retroactive aspects will be considered in determining the applicability of the adopted rule.

A number of products for which special conditions have not as yet been issued are undergoing type certification at the time of this amendment. Should the FAA conclude that recent or future amendments to this subchapter should be applied to these products that would not otherwise be applicable under § 21.17(a) (1) then an amendment to require retroactive application will be proposed and acted upon through the general rulemaking process explained above, in lieu of issuing special conditions under § 21.16.

Also, the provisions of § 21.21(b) (2) will no longer be used to justify the issuance of special conditions. However, just as an Airworthiness Directive may be issued under Part 39 to require the correction of an unsafe condition that is likely to exist or develop in a product of the same type design, notwithstanding a showing of compliance with the applicable airworthiness standards, § 21.21(b) (2) may continue to be used to deny issuance of a type certificate if a similar unsafe feature or characteristic is found during the type certification process, notwithstanding a showing of compliance with requirements designated by § 21.17. The unsafe features and characteristics envisaged by § 21.21(b) (2) are those related to specific design configuration or product characteristics of a particular design, that one would not normally expect the applicable airworthiness standards to specifically preclude because of their intentionally objective nature.

It is the practice of the FAA to develop and publish a Type Certificate Data Sheet as an integral part of each type certificate. The type certification basis is recorded on the Type Certificate Data Sheet for public information. In the future the type certification basis statement will identify not only the applicable regulation, including special conditions, but also will identify all exemptions issued pursuant to Part 11, together with "equivalent safety findings" made in accordance with § 21.21(b) (1).

For the above reasons, Proposal 8-2 is withdrawn.

In considering its disposition of the proposal to amend § 21.16(a), the FAA realizes that a "novel or unusual design feature" today may become a common design feature of the future. The issuance of a like special condition for several product designs will most likely compel general rule making on that subject and the history of that special condition could have a very strong influence on thinking when general rule making is initiated. Also, although special conditions are regulations of particular product applicability, they are issued only in the interest of public safety. For these reasons, Part 11, and § 21.16 of Part 21 are amended to require special conditions to be issued in accordance with the existing general rule-making procedures. As is now the case, a docket will continue to be maintained for each set of special conditions, and all material in the docket will continue to be available for public review.

Proposal 8-3. This proposal is one of a group of proposals dealing with the establishment of Instructions for Continued Airworthiness and the responsibilities of maintenance personnel and aircraft operators with respect to those instructions. The group is made up of the following proposals: 8-3, 8-5, 8-21, 8-25, 8-58, 8-62, 8-64, 8-67, 8-77, 8-80, 8-89, 8-91, 8-92, 8-93, 8-97, 8-98, 8-99, 8-104, 8-106, 8-107, 8-110, and 8-111.

A commenter representing a number of scheduled air carriers objects to the requirement in § 21.31(c) that the type design include the Airworthiness Limitations section of the Instructions for Continued Airworthiness because of the information to be included in that section. Although this commenter does not object to including mandatory replacement times for life-limited parts in the Airworthiness Limitations section, the commenter strongly objects to including inspection intervals and related procedures. Under proposed §§ 43.16 and 91.163(c), the commenter points out, air carriers would be required to comply with these maintenance-related airworthiness limitations. The FAA does not agree that inspection intervals and related procedures can be omitted from the Airworthiness Limitations section of the Instructions for Continued Airworthiness. For example, the proposed Airworthiness Limitations section on a transport category airplane must contain mandatory inspection intervals and related procedures because the damage-tolerance concept described in § 25.571 is predicated upon the use of such inspections to detect initial cracks in principal structural elements before crack growth under repeated loads could progress to a degree which would cause catastrophic failure of the airplane. However, the FAA does agree that §§ 43.16 and 91.163(c) should permit modification of these intervals and procedures by other FAA approved methods. Accordingly, inspection programs approved under §§ 121.25(b), 121.45, 121.367, 123.21(b), 127.13(b), 127.133, 135.5, 135.17, 135.419, 135.421, and 135.425, as defined by approved operations specifications, or an inspection program approved under § 91.217(e) constitute acceptable alternatives. The appendices to Parts 23, 25, 29, 31, 33, and 35 as adopted in this amendment require the applicant to specify (in the Airworthiness Limitations section) mandatory replacement times, inspection intervals, and related procedures. Sections 43.16 and 91.163(c) have been revised to show that only the inspection times and procedures may be adjusted under approved alternative programs.

A commenter objects to § 21.31(c), which in general is applicable to manufacturers, since continued airworthiness, which is covered in the paragraph, is the responsibility of the operator. Because this comment pertains more directly to § 21.50, it is dealt with in conjunction with Proposal 8–5.

In addition to comments relating to the Instructions for Continued Airworthiness, a commenter objects to § 21.31(a) because the proposal to include a list of drawings and specifications in the type design was not mentioned at the Airworthiness Review Conference. In fact, this proposal did appear as an FAA comment on Proposal No. 565 in the Committee I Workbook (titled "Procedures and Special Subjects") made available to all participants at the conference, and may be found in the docket.

Several commenters object to § 21.31(d) because including analyses in the type design—(1) would be redundant, since it is already required as part of the substantiating data; (2) is unnecessary, since the drawings and specifications required under current § 21.31(a) provide the general information needed by the FAA; and (3) introduces the possibility that the FAA would require the manufacturer to provide any and all data used to prepare the drawings and specifications, thereby delaying type certification. The FAA agrees that proposed § 21.31(d) would serve no useful purpose and it is withdrawn.

Proposal 8–4. A commenter objects that § 21.35(b) (2) eliminates flight testing for reliability, contending that analysis and ground test are not dependable as a basis for certification. In the light of this comment, and after further consideration and experience, the FAA has determined that flight testing for reliability does provide safety information not necessarily obtainable from analysis and ground test. Accordingly, the proposal to delete the reference to reliability in § 21.35(b) (2) is withdrawn.

No adverse comment was received on the proposal to replace the word "airplanes" in § 21.35(b) (2) with the word "aircraft" and this amendment to § 21.35(b) (2) is adopted without change.

Proposal 8–5. A commenter objects to the continued airworthiness provisions of § 21.50(b) (and also proposed § 21.31(c)) contending that—(1) continued airworthiness is the responsibility of the operator/owner; (2) current regulations in Parts 23 and 25 already require manufacturers to make available recommended maintenance procedures for the product at the time of its delivery; (3) current operating rules require the operator/owner to establish and comply with a maintenance program; and (4) with respect to transport airplanes, the present FAA Maintenance Review Board (MRB) system is an entirely satisfactory way of establishing the means for maintaining airworthiness. Current FAA practice allows operators of new transport category airplanes to utilize FAA MRB recommendations (reference FAA Advisory Circular No. AC 121-22) for starting their maintenance programs, and then vary them with FAA approval as experience and operating conditions dictate. The commenter points out that, contrary to that practice, the amendment will require the manufacturer to obtain FAA approval of its recommended maintenance procedures before the airplane is type certificated, and to obtain FAA approval of revisions to those procedures (necessitated by any improvement change in the airplane) before approval of the change itself. This, the commenter states, will impose a severe and unnecessary hardship on the manufacturer.

On the first and second points, although the operator/owner does have responsibility for continued airworthiness, the FAA has found that the recommended maintenance procedures made available under current regulations are frequently inadequate in scope and content, and often do not provide a sound basis for the operator/owner to maintain the airworthiness of the aircraft. The FAA has concluded that the lack of such recommended maintenance procedures can best be remedied by requiring that they be made available to owners and operators by the type certificate or supplemental type certificate holder. On the third point, while it is true that not all operators/owners are required to establish and comply with a continuous airworthiness program, those that voluntarily wish to set up such a program are often handicapped by the lack of comprehensive instructions, which would be remedied by § 21.50(b). On the other hand, those required to establish a program will benefit from the more detailed and comprehensive instructions made available to them under § 21.50(b). On the fourth point, which is directed toward aircraft that will be maintained in accordance with an FAA approved operations specification and maintenance program under Parts 121, 123, 127, 135, or an approved inspection program under § 91.217(e), the FAA recognizes that these procedures for maintaining airworthiness of the products have functioned satisfactorily. In this regard, the FAA expects that operating segments of the air transportation industry would continue to work with type certification applicants in defining adequate maintenance instructions prior to type certification. The FAA MRB document, which is a product of contributions made by both the operators and manufacturer, could be picked up by the type design holder and included as a part of the required Instructions for Continued Airworthiness, thus continuing the usefulness of the existing MRB practices for the original entry into service of new product designs. Likewise, the additional maintenance instructions that would be required and which are not typical to MRB documents, but are presently required in air carrier operators' FAA approved maintenance programs, could also be picked up by the type design holder. Therefore, the screening process that would be utilized by the FAA in reviewing such maintenance documents would not unnecessarily delay type certification or approval of design changes after certification. See also the discussion under Proposal 8-3.

A commenter questions the need for the provision in § 21.50(b) requiring that the Airworthiness Limitations section of the Instructions for Continued Airworthiness be furnished with each aircraft, engine, or propeller. The FAA agrees that this provision is unnecessary, as the type certificate holder must make the manual available, and the operator/owner must comply. To require a manual to be furnished with each equipment would be redundant, and in some instances, would be unnecessary. Accordingly, the requirement that the Airworthiness Limitations section be furnished with each airplane or product is revised to require that the section be furnished to each owner of the type.

A commenter objects to § 21.50(b) insofar as it applies to rotorcraft type certificated under Parts 27 and 29, contending that the manufacturer is already required under those parts to furnish a maintenance manual, which has allegedly been proven adequate. The FAA does not agree. The proposed Instructions for Continued Airworthiness, which are broader in scope and more detailed than the maintenance manual currently required under Parts 27 and 29, would provide the operator/owner with the minimum amount of information needed to maintain the airworthiness of increasingly complex rotorcraft currently being designed.

A commenter suggests that § 21.50(b) be revised to make it clear that an aircraft manufacturer need not supply Instructions for Continued Airworthiness pertaining to engines and propellers until the complete aircraft is delivered to the first retail purchaser. The continued airworthiness instructions for propellers and engines should be provided to the aircraft manufacturer to facilitate transmittal to purchasers of the aircraft.

A commenter notes that § 21.50(b) would require an aircraft manufacturer to make the Instructions for Continued Airworthiness available to the owner upon delivery of the aircraft and to any other person required to comply with any of the terms of those instructions *upon request.* Since such a request could be made before the first aircraft delivery, it could impose an unnecessary burden on the aircraft manufacturer. The commenter suggests that § 21.50(b) be revised so that such a request need not be filled until after delivery of an aircraft to the first owner. The FAA agrees that an early request for the Instructions for Continued Airworthiness could impose an unnecessary burden on the manufacturer. Additionally, the FAA notes that airplanes can be delivered to an operator, prior to full type certification, with a provisional airworthiness certificate to allow activities such as crew training, and therefore prior to the approval of the Airworthiness Limitations section. Accordingly, the phrase "upon request" has been deleted from § 21.50(b) and the language has been revised to require that at least one set of the complete Instructions for Continued Airworthiness be furnished upon delivery to the customer, or subsequent to issuance of the first standard certificate of airworthiness, whichever occurs later.

Proposal 8–6. Commenters object to the proposal to make § 21.97(b) applicable to all products rather than to engines only because—(1) the volume of paperwork would increase out of proportion to any benefits that might be gained; (2) the applications for supplemental type certificates would be significantly more complex, since there are frequently many configuration variations within an aircraft model and a fleet operator would have to list all of the configurations or make separate application for each; and (3) the term "specific configuration" must be defined if the proposal is to be properly administered. In light of these comments and after further consideration, the FAA concludes that this proposal requires additional study and it is withdrawn.

Proposal 8–7. No unfavorable comment was received on the proposal to amend § 21.123 to require a manufacturer to submit a manual describing its production inspection system and means for controlling materials and parts. Accordingly, the proposal is adopted without substantive change.

Proposal 8–8. A commenter objects to § 21.143(a) (2) contending that substitution of the word "supplier" for "subsidiary" introduces a major change to the requirements, involving increased paperwork and costs. The FAA does not agree. The FAA has consistently administered § 21.143(a) (2) as applying to *all* raw materials, purchased items, parts, and assemblies supplied to the prime manufacturer. The change does not involve increased paperwork or costs because it is a semantic change which clarifies the definition of persons or entities subject to the quality control data requirements of § 21.143, without expanding any of those requirements. The use of the term "subsidiary" is unclear because it implies that there must be a corporate connection between the prime manufacturer and his supplier. Accordingly, the language has been revised to reflect the FAA's intent that the quality control data requirements of § 21.143(a) (2) apply to all "suppliers" of each prime manufacturer. For similar reasons and for internal consistency, § 21.143(b) is revised to replace the term "subsidiary manufacturers" with the term "suppliers".

Proposal 8–9. No unfavorable comment was received on the proposal to amend § 21.182 to ensure that the proposed new § 45.11(c) is cross referenced. Accordingly, the proposal is adopted without substantive change.

Proposal 8-10. A commenter raises the question whether a special flight permit issued under § 21.197(a) (3) would serve as a certificate of airworthiness for international flights. The FAA notes that international flights cannot be conducted under special flight permits issued under § 21.197 unless specifically authorized by the foreign authorities concerned.

Another commenter objects to § 21.197(a) (3) (ii) because as worded, the individual aircraft would have to be flown for at least 50 hours, thereby defeating the purpose of the original proposal (as submitted for the Airworthiness Review) which aimed at eliminating unnecessary delays in obtaining FAA approval of customer demonstration flights. The commenter suggests that this provision be changed to stipulate that the aircraft type must have been flown for at least 50 hours. The FAA agrees that since the proposal concerns aircraft manufactured under a production certificate, and since the aircraft type could have been flown for at least 50 hours during the type certification program, the 50 hours of flight provision is not necessary. However, the FAA does not agree with the commenter's suggested revision. It is necessary to require that production flight tests for the individual aircraft involved be satisfactorily completed before that aircraft is flown on customer demonstration flights. Accordingly, § 21.197(a) (5) is added to prescribe this condition in place of the 50 hours of flight provision.

The same commenter also suggests that § 21.197(a) (3) (ii) should be made applicable to aircraft produced under a type certificate only, since such aircraft received close production surveillance by the FAA. The FAA agrees that a production certificate should not be the limiting factor in obtaining FAA approval of customer demonstration flights. If the aircraft has been demonstrated to otherwise meet all the safety requirements for a standard airworthiness certificate, then customer demonstration flights could be permitted. This proposal is adopted by the addition of § 21.197(a) (5).

In addition, the commenter suggests that proposed § 21.197(a) (3) (ii) be amended with a reference to the maintenance and inspection programs called for under § 21.195 for Experimental and Subpart C Provisional Type Certificates. Such procedures would unnecessarily complicate the issuance of permits for customer demonstration flights and would in effect nullify the original proposal. The portion of the proposal calling for maintenance and inspection programs in these instances is therefore withdrawn.

Proposal 8-11. No unfavorable comments were received on the proposal to amend § 23.253(b) (3) to ensure that high speed buffeting does not become severe enough to prevent the pilot from reading the instruments or controlling the airplane. Accordingly, the proposal is adopted without substantive change. Also see Proposal 8-28.

Proposal 8-12. No unfavorable comments were received on the proposal to amend § 23.361 to redefine the limit engine torque load conditions to be considered for turbine engine installations and to make other clarifying changes. Accordingly, the proposal is adopted without substantive change.

Proposal 8-13. The FAA does not agree with a commenter who suggests that the lead-in of § 23.371 be revised to make the gyroscopic load requirements applicable to piston as well as turbine engines. The FAA has no information to indicate a need for coverage of piston engines in this regulation, nor was any submitted by the commenter.

Another commenter concurs with § 23.371, assuming that a rational analysis of loads under § 23.371(a) is an alternate to the loads specified in § 23.371(b). This assumption is correct. No change to § 23.371 was proposed in this regard. Section 23.371 is adopted without substantive change.

Proposal 8-14. A commenter suggests that the word "operated" in § 23.729(c) be replaced by the word "lowered". The commenter states that the intent of the rule is to ensure that the gear can be lowered in an emergency. The FAA concurs, but the word "extended" is used to preserve the internal consistency of the section. Section 23.729(c) is revised accordingly.

This commenter also questions whether § 23.729(e) would require an "up lock". The commenter is evidently referring to a "lock" in the sense of a positive means other than hydraulic pressure, as required to keep the gear extended by § 23.729(b). Section 23.729(e) contains no such requirement.

Another commenter suggests that the second sentence of § 23.729(e) be revised to add the words "and secured" after the words "fully extended" and "fully retracted" in order to clarify what functions the lights would indicate to the pilot. The first sentence of the paragraph clearly states that the indicators should inform the pilot that the gear is secured in the extended or retracted position.

A commenter states that the proposal is redundant since the requirement is already in effect. The FAA does not agree. This is one of several new provisions being incorporated into the current regulations to assure the reliability of small land-plane landing gear systems.

After further review, the FAA has determined that the words "and warning device" should be removed from the heading of § 23.729(e) to preclude confusion between the requirements of this paragraph and those of § 23.729(f). Section 23.729 is adopted with editorial changes and the revisions discussed.

Proposal 8-15. A commenter objects to § 23.903(f) on the grounds that it imposes new and unjustified criteria for restart capability of reciprocating engine powered airplanes. The FAA believes the requirement to be fully justified. Accidents have occurred with multiengine reciprocating powered, as well as turbine powered airplanes because pilots have not been adequately apprised of the engine restart envelope for their airplane. Therefore, the requirement must apply to both types of engine installations.

This commenter further states that § 23.903(g) is acceptable provided that the "restart requirement is understood to be within the restart envelope for the aircraft (if one is approved for the aircraft)." Present § 23.903(e) (3), as applicable to turbine engine powered small airplanes, states that it must be possible to restart an engine in flight, and § 23.903(f) requires that an approved restart envelope be established. Therefore, development of a restart envelope would be required for the approval of each turbine engine powered small airplane. As adopted, § 23.903(g) requires that, following in-flight shutdown of all engines, electrical power for ignition exists throughout the approved restart envelope.

Another commenter states that it seems inconsistent to require that electrical power be provided for ignition but not for rotational capability sufficient for an engine start. The FAA does not agree. As adopted, the rule provides for those circumstances where engine windmilling speed is sufficient for restarting but insufficient to provide electrical power for ignition.

The proposal is adopted without substantive change. However, § 23.903(f) is revised to make it clear that the specified in-flight engine restart capability is required throughout the required altitude and airspeed envelope.

Proposal 8-16. No unfavorable comment was received on adding a new § 23.905(d) referencing propeller blade pitch control system durability requirements. Accordingly, § 23.905(d) is adopted without substantive change. For discussion of a related proposal to add a new § 35.42, see the discussion under Proposal 8-103.

Proposal 8-17. A commenter suggests that since the requirement for fuel tanks to retain fuel during a landing with landing gear retracted or collapsed may be subject to individual interpretation, advisory material on compliance methods should be reviewed with industry prior to implementation of the rule. The FAA does not agree. The revision merely clarifies an existing requirement. Section 23.967 is adopted without substantive change.

Proposal 8-18. A commenter recommends that the proposal to add a new § 23.991(d) which requires that operation of any fuel pump does not adversely affect continuous engine operation, be withdrawn or its adoption delayed while the compatibility of engine and airplane fuel systems is studied. The compatibility between these systems must be established in the design process, and the relevant design considerations are well known. Delaying the requirement in favor of additional study is not warranted.

Another commenter contends that the requirement is beyond the needs of safety. The FAA agrees that the proposed requirement is too restrictive and § 23.991(d) is revised to provide that the operation of any fuel pump may not affect engine operation so as to create a hazard.

Two commenters disagree with adding a new § 23.991(d), contending that it eliminates present fuel system designs. The FAA has no information to suggest that compliance with the revised section, as discussed above, would be impossible using present fuel system designs, nor was any presented by the commenter.

The proposal is adopted with the revision discussed above.

Proposal 8-19. No unfavorable comments were received on the proposal to amend § 23.1305(n) to permit movement of the propeller blade up to 8° below the flight low pitch position before an indication of the movement is required for the flight crew. Accordingly, the proposal is adopted without substantive change.

Proposal 8-20. For comments related to withdrawal of the proposal to revise § 23.1521(a), see Proposal 8-94.

Proposal 8-21. Since the proposal for § 23.1529 is substantively identical to those for §§ 25.1529 (Proposal 8-58), 27.1529 (Proposal 8-64), and 29.1529 (Proposal 8-77), all comments on these proposals are considered here.

A commenter notes that although the explanation for § 23.1529 makes it clear that the Instructions for Continued Airworthiness need not be finalized until delivery of the first airplane, the proposal itself seems to require that they be finalized before type certification. The commenter suggests that this point be clarified. The FAA agrees, and §§ 23.1529, 25.1529, 27.1529, 29.1529, 31.82, 33.4, and 35.4, are revised accordingly.

In response to a commenter representing a group of scheduled air carriers, the FAA notes that, except for the Airworthiness Limitations section, there is no requirement that any operator/owner use the Instructions for Continued Airworthiness referred to in §§ 23.1529, 25.1529, 27.1529 and 29.1529. Moreover, the new §§ 43.13(a), 43.16, and 91.163(c) allow the use of other methods. In particular, the use of maintenance manuals and continuous airworthiness maintenance programs developed under current Parts 121, 123, 127, and 135, or an inspection program approved under current § 91.217(e), would be acceptable alternatives to the Airworthiness Limitations section. This commenter suggests that language be added to § 25.1529 to make it clear that alternatives to the Instructions for Continued Airworthiness (except the Airworthiness Limitations section) may be used. This suggestion was not adopted because §§ 43.16 and 91.163(c) make this provision sufficiently clear.

Proposal 8-22, 8-23, and 8-24. Final action on Proposals 8-22, 8-23, and 8-24 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; Oct. 30, 1978).

Proposal 8-25. The proposals to add an appendix to Parts 23, 25, 27, and 29 (Proposals 8-62, 8-67, and 8-80) setting forth Instructions for Continued Airworthiness are substantively identical and are discussed below. Unless otherwise stated, the discussion refers to the designated sections in each of the appendices mentioned above.

§ *XX.1(a).* A commenter objects to the concept of specifying requirements (as opposed to providing guidance) for the preparation of Instructions for Continued Airworthiness, contending that such requirements would lead to time-consuming negotiations between the manufacturer and the FAA, and that some flexibility in providing the instructions is necessary. The appendix sets forth, in broad objective terms, the *kinds* of information the Instructions for Continued Airworthiness must contain. Within this framework, the manufacturer would be free to develop detailed instructions appropriate to its aircraft. The FAA is confident that the appendix provides a reasonable measure of flexibility, and anticipates no difficulties or delays in determining the acceptability of the Instructions developed by the manufacturer.

§ *XX.1(b).* A commenter objects to the requirement that Instructions for Continued Airworthiness be provided for appliances, contending that—(1) this information is often not available from the appliance manufacturer; (2) even when available, the information sometimes has to be revised for the particular application in a manner not approved or intended by the appliance manufacturer; and (3) the information necessary for customized equipment installations would be unreasonably costly to develop. The FAA does not agree. Such information, which is essential to the continued airworthiness of the aircraft, should be provided for each required product. Accordingly, the language of § XX.1(b) is revised to make it clear that if the aircraft manufacturer does not supply continued airworthiness instructions for the product, the Instructions for Continued Airworthiness for the aircraft must include this information. See also the discussion under § XX.3(a) (5) (i).

A commenter objects to the proposal to include information on engines and all appliances in the Instructions for Continued Airworthiness, contending that—(1) such information should be furnished by the engine or appliance manufacturer; and (2) with respect to appliances, only those for which standards have been established by FAA should be covered. On the first point, manufacturers of new engine designs are required to supply the information for their products under new § 33.4. Manufacturers of new aircraft using currently certificated engines are required by § XX.1(b) to provide the information for the engine in their Instructions for Continued Airworthiness for the aircraft. In practice, the FAA expects this information to be developed and supplied by the engine manufacturer. A similar requirement for appliances would be administratively impracticable because of the large number involved. On the second point, it should be noted that specific performance and safety standards have not been established for all essential appliances. However, upon further review, the FAA concludes that it would be unreasonable to require the aircraft manufacturer to cover appliances other than those required in applicable regulations. Accordingly, § XX.1(b), as adopted, refers only to appliances "required by this chapter."

§ *XX.2.* A commenter suggests a revision of this section to make clear that the Instructions for Continued Airworthiness may consist of a series of volumes, or may be supplied in other than book form, such as on microfilm or microfiche. The language in § XX.2 is sufficiently broad to cover these acceptable alternatives. Reference to the Air Transportation Association of America Specification No. 100 (where it appeared) is deleted from § XX.2(b) because it is nonregulatory.

§ *XX.3, lead-in paragraph.* A commenter objects to the requirement that the contents of the manual "be prepared to be understood by the persons who will be responsible for maintaining" the aircraft or product, contending that—(1) it would impose a subjective standard that would be impossible to meet; and (2) it could be interpreted to mean that, in some circumstances, manuals for aircraft to be exported must be prepared in the language of the country of export. In light of these comments, the first sentence of the lead-in paragraph of § XX.3, is revised to read as follows: "The contents of the manual or manuals must be prepared in the English language." This conveys the intent of the original proposal. A commenter points out that there may be different levels of maintenance instructions, directed at different classes of operators. For example, the maintenance instructions provided to a fleet operator or commuter airline may be more comprehensive than those provided to a fixed base operator. Any level of maintenance instructions considered appropriate by the manufacturer may be submitted, provided that those instructions comply with the minimum standards in the appendix.

§ *XX.3(a) (2).* A commenter recommends that the requirement for complete descriptions be limited in scope to the "standard" aircraft and "quantity-installed" optional equipment, contending that it would be virtually impossible to devise "custom" maintenance manuals for each product because of the many combinations of equipment that may be ordered by the purchaser. In addition, the commenter states that a manual containing all of these combinations would be difficult to use. The FAA does not agree. To achieve its purpose, the Instructions for Continued Airworthiness must contain information on each item of equipment required by regulation to be installed on the aircraft. The FAA notes that supplemental type certificates (STC's) are required for installation of equipment not a part of the type certificate, and that this maintenance manual requirement is equally applicable to the STC applicant.

§ *XX.3(a) (3).* A commenter recommends that since maintenance personnel have no need for the kind of operating information provided in a Pilot's Operating Handbook, the paragraph be revised to require only *basic* principles of equipment control and operation. The FAA agrees, and § XX.3(a) (3) now refers to "basic control and operation information."

§ *XX.3(a) (5) (i).* A commenter recommends that applicants be allowed to refer to a component manufacturer as a source of information instead of including the information in the Instructions for Continued Airworthiness. The commenter argues that many component manufacturers prefer to maintain control of their maintenance information to ensure that it is up to date. In other cases, maintenance at the factory may be required because of the complexity of the equipment. The FAA recognizes that some accessories, instruments, and equipment have an exceptionally high degree of complexity, requiring specialized maintenance techniques, test equipment, or expertise. In such cases, it would be in the interest of safety to allow the applicant to refer to the appropriate manufacturer in the maintenance instructions. The FAA does not agree, however, that such reference should be allowed in other circumstances. Section XX.3(a) (5) (i) (redesignated § XX.3(b) (1)) is revised accordingly.

A commenter recommends that the last sentence of § XX.3(a) (5) (i), be revised to allow reference to a separate inspection program, rather than include it in the maintenance instructions, so that the inspection program could be better kept current and also tailored to an individual operator's needs. The FAA does not agree. The inspection program must be set forth in the Instructions for Continued Airworthiness to ensure its availability to those who will benefit from it.

The FAA, after further study of § XX.3(a) (5) (i), has decided that the provision should specifically require a description of applicable maintenance or wear tolerances. Section XX.3(a) (5) (i) (redesignated § XX.3(b) (1)) is clarified in this regard.

§ *XX.3(a) (5) (ii).* A commenter objects to the words "could occur" in this paragraph because it encompasses everything within the realm of possibility, thereby unnecessarily increasing the volume of the maintenance instructions. The phrase "probable malfunctions" replaces the phrase "typical malfunctions that could occur" in § XX.3(a) (5) (ii) (redesignated § XX.3(b) (2)).

§ *XX.3(a) (5) (iii).* A commenter suggests that this paragraph would be clearer if the first three words and the last five words are deleted. Section XX.3(a) (5) (iii) (redesignated § XX.3(b) (3)) is revised accordingly.

§ *XX.3(a) (5) (iv).* A commenter suggests revision of this paragraph to make it clear that the overweight landing check refers to the condition in which a certificated landing weight is lower than certificated takeoff weight, since the aircraft manufacturer cannot speculate what damage might be done to an aircraft that takes off and must immediately land at a weight near the certificated takeoff weight. This comment may have merit for certain aircraft. Moreover, since an overweight landing is but one of several occurrences which would necessitate a check to determine aircraft damage, to single out one occurrence would imply that the others need not be covered in the maintenance instructions. Accordingly, the words "checks after an overweight landing" are deleted from § XX.3(a) (5) (iv) (redesignated § XX.3(b) (4)).

§ *XX.3(b).* A commenter recommends deletion of the requirement for an overhaul manual or section, contending that—(1) there are many products that, for safety reasons, should not to be overhauled; and (2) the manufacturer must make the technical assessment as to whether a product can be safely overhauled. In the light of these comments, and after further consideration, the FAA finds that those portions of § XX.3(b) that provide for overhaul information only (except for engines), should not be required in the Instructions for Continued Airworthiness. Accordingly, §§ XX.3(b) (1) (i), XX.3(b) (1) (ii), XX.3(b) (1) (iv), XX.3(b) (1) (viii), and XX.3(b) (3), are withdrawn. The other provisions of § XX.3(b) specify information that is needed for purposes other than overhaul.

§ XX.3(b) (1) (iii). No adverse comment was received on this proposal to require structural access plate information. Accordingly, it is adopted as proposed, but redesignated § XX.3(c).

§ XX.3(b) (1) (v). No adverse comment was received on this proposal to require instructions on special inspection techniques. Accordingly, it is adopted as proposed, but redesignated § XX.3(d).

§ XX.3(b) (1) (vi). A commenter points out that no part can be restored to its original condition by protective coatings or treatments. The FAA agrees, and § XX.3(b) (1) (vi) (redesignated § XX.3(e)) is revised to make this clear and to require only the information necessary to apply protective treatments to the structure after inspection.

§ XX.3(b) (1) (vii). No adverse comment was received on this proposal to require data on structural fasteners. Accordingly, it is adopted as proposed, but redesignated § XX.3(f).

§ XX.3(b) (1) (ix). No adverse comment was received on the proposal to require a list of special tools. Accordingly, it is adopted as proposed, but redesignated § XX.3(g).

§ XX.3(c). Three commenters object to the concept of supplying generalized repair data. One contended that—(1) the nature of the damage may not be known in a particular case, though it may appear to fall under a general repair "fix"; (2) the safety of the product may be seriously impaired by repairs made in such instances; and (3) the manufacturer can provide alternate means for a mechanic to obtain repair data. In the light of these comments, the FAA agrees that it is not necessary to include the repair information in the Instructions for Continued Airworthiness as proposed. Accordingly, proposed § XX.3(c) is withdrawn.

§ XX.4. A commenter suggests that the manufacturer should be allowed to list items in the Airworthiness Limitations section that it deems necessary to maintain structural integrity, where such items are not called out in the applicable airworthiness standards. Another commenter, representing the scheduled airlines, objects to the inclusion, in the Airworthiness Limitations section, of mandatory replacement times for parts other than life-limited parts and of mandatory inspection intervals. The resolution of these comments is discussed under Proposal 8-3. The language proposed for the Airworthiness Limitations sections of the appendices to Parts 23, 25, 27, and 29 is being retained, except that the mandatory replacement times, mandatory inspection intervals, and related procedures are specified as those associated with structural integrity—including those approved under current § XX.571. It also is made clear that FAA approved alternative programs may be used. To avoid unnecessary restriction being placed on operation, only these items are listed in the pertinent Airworthiness Limitations section. Other items can of course be listed in other sections of the Instructions for Continued Airworthiness.

Proposal 8-26. The addition of new §§ 25.101(i) and (j) would set forth requirements for automatic systems that affect performance, including automatic takeoff thrust control systems (ATTCS). In view of the evolving technology of automatic systems, the special features and functions of each design, and the complex interrelationships with other systems, the FAA has concluded that specific regulations are premature and that safety considerations can be more advantageously addressed in special conditions for specific systems. Accordingly, Proposal 8-26 and related Proposals 8-34, 8-48, and the § 25.1305(c) (9) portion of 8-50 are withdrawn.

Proposal 8-27. The revision of § 25.111(c) (4) will permit changes in power or thrust by an automatic takeoff thrust system but prohibit any change requiring action by the pilot when determining the takeoff path. Although specific proposals relating to criteria for automatic takeoff thrust systems have been withdrawn, the FAA believes that this proposal should be retained as it standardizes the procedure for determining the takeoff path, and is consistent with current practice.

One commenter implies that this rule change will add the task of monitoring conditions and instruments and thereby increase the pilot workload. Other commenters suggest that a limited provision for manual throttle setting be included, or are opposed to the proposal completely on the grounds that safety will be compromised in service. Since the rule will apply in the context of a determination of performance rather than an operating requirement, the proposal is adopted without change.

Proposal 8–28. A commenter suggests that the term "impair" in § 25.253(a) (2) (iii) be changed to "significantly impair". The FAA does not agree. In present high altitude, high Mach number jet airplanes, any recovery from upset or speed anomaly must be done essentially by reference to flight instruments. Therefore, any buffet or vibration condition which would in any way impair the pilot's ability to accurately interpret instrument information cannot be tolerated. The same commenter stated that some interpretative material on vibrational frequencies and levels of acceleration would be useful. Use of interpretative material would divert attention from the primary consideration, impairment of pilot ability, which is qualitative. Proposed § 25.253(a) (2) (iii) is adopted without substantive change.

Proposal 7–17. Although no unfavorable comment was received on the proposal to amend § 25.305(d), two commenters state that their agreement was with the understanding that both the discrete gust and the continuous turbulence analyses are required. Present § 25.341(a) requires that limit load factors be established by reference to a discrete gust encounter. Present § 25.305(d) specifies that the dynamic response of the airplane to vertical and lateral continuous turbulence must be taken into account. Both analyses are required.

Two commenters recommend that present § 25.341 be amended to require dynamic loads analysis by reference to discrete gusts having varying gust gradient distances. The FAA does not agree. The combination of discrete gust analysis under § 25.341 and continuous turbulence analysis under § 25.305 is less complex than the method described by these commenters and provides sufficient substantiation of strength. The proposal is adopted without substantive changes.

Proposal 8–29. Many negative comments were received on the proposal to revise § 25.307(a) to require ultimate load tests for each normal and fail-safe critical load condition. Three commenters indicate that the proposed regulation would add to the cost and time required for certification although present airplane safety records do not support the need for a change. One commenter points out that the design philosophy used for commercial transports, due to the dominant influence of the economic requirement for long life without structural fatigue problems, often produces reserve margins of safety. Another commenter proposes that ultimate load tests be limited to structures such as composites, which substantially differ from conventional structure. The FAA agrees that to conduct ultimate load tests for all critical load conditions would greatly increase the amount of testing required, which is not warranted by the safety record since there have been no service features which indicate that present methods of substantiation are inadequate. In many cases failures in service result from conditions such as fatigue or corrosion which are not covered by ultimate load tests. The proposal to require ultimate testing of all structural components therefore is deleted. In some cases, however, analysis must be supplemented by limit and/or ultimate load tests. The amendment, as adopted, is revised accordingly.

Proposal 8–30. Several negative comments were received on §§ 25.365(e) and (f), requiring airplane designers to consider pressure vessel decompression resulting from the loss of any nonplug door, detonation of a bomb within the cabin at all probable locations, and engine disintegration. Several commenters oppose designing for the loss of a nonplug door, stating that there is no reason why nonplug doors cannot be designed to be as safe as plug doors. These commenters suggest that the door design criteria be upgraded to improve door integrity. The FAA agrees that door integrity should be improved to the extent that design for their loss is not justified. Therefore § 25.783 is revised in response to Proposal 8–35 to require this improved level and § 25.365(e) (1) is withdrawn.

Many commenters object to designing for all possible bomb detonations and probable bomb locations. A commenter points out that airworthiness requirements in the past have attempted to safeguard aircraft against structural and mechanical failure, human error, natural hazards, etc. They note that no one has attempted to incorporate into airworthiness requirements the consequences of homicidal or suicidal tendencies. Another commenter states that the aircraft industry has to accept responsibility for compensating the public for loss or injuries resulting from defects in its products, and the inclusion of a bomb damage requirement in Part 25 could significantly extend the grounds of possible product liability actions, particularly with the imprecise requirements of § 25.365(e). Many commenters state that the wording of § 25.365(e) (3) is so vague as to make its implementation impossible. The FAA notes that, ultimately, minimizing the loss of airplanes as a result of bomb explosions is a ground security problem.

A commenter suggests an alternative to § 25.365(e) (3) which would establish a relationship between the design maximum opening and the cross-sectional area of the pressurized shell. The FAA agrees that the proposed relationship provides an acceptable method for determining hole size. The FAA has determined that the maximum hole size required should be 20 square feet, a value contained in Airworthiness Directive 75-15-05 (August 11, 1975) pertaining to openings in wide-body transports. Section 25.365(e) (3) is revised to allow the maximum opening to vary as a function of the cross-sectional area of the pressurized shell to account for the differences in size between narrow and wide-body transports and is redesignated and adopted as § 25.365(e) (2).

The FAA finds that the maximum opening specified in adopted § 25.365(e) (2) will exceed the opening that would result from causes other than bomb explosions or engine disintegration, and that a probability safety analysis to determine hole size in passenger or cargo areas resulting from other causes is not needed. Thus, proposed § 25.365(f) is withdrawn.

In light of the comments received on proposed § 25.365(e) (4), and after further consideration, the FAA concludes that openings caused by airplane or equipment failure can occur in any compartment, and that partitions, bulkheads, and floors should be designed for openings from these causes. Thus, proposed § 25.365(e) (4) is revised accordingly, redesignated, and adopted as § 25.365(e) (3).

No adverse comments were received on proposed § 25.365(e) (2) to require design to withstand penetration of the cabin by a portion of an engine following engine disintegration and the proposal is redesignated § 25.365(e) (1) and adopted without substantive change.

Amendment to § 25.571(a) (3). Because of the change to § 25.1529 adopted in this amendment, the reference to the "maintenance manual" in § 25.571(a) (3) is no longer appropriate. For consistency, § 25.571(a) (3) references the Airworthiness Limitations section of the Instructions for Continued Airworthiness.

Proposal 8-31. Numerous unfavorable comments were received on the proposal to add a new § 25.633 requiring that essential systems be designed to minimize damage caused by detonation of a bomb in the airplane. Most commenters contend that there is no means to protect essential systems from all possible bomb detonations and that bomb size and location cannot be rationally defined. Several commenters indicate that the separation of essential systems on modern airplanes presently provides a measure of protection and that the proposed requirements of § 25.633 are beyond the state of the art.

The FAA agrees that a rational means of determining and defining all possible bomb size/location combinations which would damage essential systems does not exist. Therefore, the proposal is withdrawn.

Proposal 8-32. Several commenters object to the proposed horizontal stabilizer "trim-in-motion" aural warning requirement of § 25.677(e) on the grounds that the aural environment in today's cockpits is already cluttered and that finding new and distinctive aural warnings is becoming difficult. They further suggest that small increments of trim change should not cause aural warning, and that warnings should be given only when a safety-of-flight hazard exists. One commenter suggests that there is no need for separate aural warning on aircraft having direct trim control wheels in the cockpit.

The FAA agrees with the comments and upon further review concludes that the proposal is premature and unworkable. Accordingly, it is withdrawn for further study.

Proposal 8-33. Several adverse and supporting comments were received on the proposal to add a new § 25.685(e) requiring arrangement of control systems to provide an airplane with the capability of continued safe flight and landing in the event of an inflight localized structural failure. Several commenters agree with the intent of the proposal and propose minor changes. One commenter agrees with the intent of the proposal, but believes that only failures which have not been shown to be extremely improbable need be considered. Commenters state that the intent of the proposed rule change is already encompassed by § 25.365(e) which would require that floor failure resulting from rapid decompression be shown to be extremely improbable.

A commenter further states that present § 25.671(c) requires control systems to be designed to be tolerant of failures, and that control system damage is more likely from other sources. The commenter claims that service experience and rational analysis show that the floor structure provides the best available protection for the control system from damage from these other sources.

After further study the FAA agrees with the commenters that the primary objectives of this proposal are adequately covered by several existing sections of FAR 25. For example: § 25.365(e) requires that the floor be designed for pressure vessel opening which is a function of the cross-sectional area of the fuselage; § 25.571 requires all structure to be damage tolerant where practical; § 25.671 requires that control systems be tolerant of failures, including exterior damage; § 25.629 requires freedom from flutter under failure conditions; § 25.631 requires protection of controls in the empennage structure from bird strikes; and § 25.901(d) requires design precautions be taken to minimize the hazards to the airplane, including control systems, in the event of an engine rotor failure. The proposal therefore is withdrawn.

Proposal 8-34. For an explanation of the withdrawal of the proposals concerning automatic systems that affect airplane performance, one of which is the proposal to add a new § 25.705, see Proposal 8-26.

Proposal 8-35 and 2-59. Several commenters object to the requirement in § 25.783(e) that provisions for the inspection of door locking mechanisms must be discernable under all possible lighting conditions. The commenters state that allowance should be made for use of supplemental lighting such as a flashlight to aid in the inspection. The FAA agrees and the section is revised accordingly.

A commenter states that direct visual inspection is only needed for external doors for which the initial opening movement is not inward and which are pressurized or for which an inadvertent opening could prevent continued safe flight and landing. Although these comments have merit, they go beyond the scope of Proposal 8-35 and interested parties have not had an opportunity to comment on these changes. No change to the section is being made based on these comments. Several commenters object to the redundancy of a dual warning system requirement and state that in lieu of redundancy, a reliability level should be specified. Further comments state that all external doors do not require this level of reliability. The FAA agrees that this reliability level could be specified and should apply only to external doors for which initial movement is not inward, and the section is changed accordingly. The present language defining where door warning systems are required is retained, as no change in present practice is intended.

A commenter suggests that § 25.783(e) should specify several good design practices. These design practices are desirable but are not essential, since the necessary level of safety can be obtained by alternate means under § 25.783.

Several commenters object to new § 25.783(f), suggesting that it apply only to nonplug type doors and doors whose loss would present a probable hazard. The FAA agrees that provisions to prevent unsafe pressurization can be limited to doors whose loss would present a probable hazard. However, the FAA does not agree that it should be limited to nonplug type doors because a plug door is defined as one whose initial opening is inward and this feature does not necessarily provide complete assurance that an unsafe pressurization will not occur with subsequent opening of the door in flight. The clarifying phrase "to an unsafe level" has been added to § 25.783(f). The intent is to prevent pressurization to a level which would be hazardous if an unlocked external door inadvertently opened.

Several commenters object to proposed new § 25.783(g) (Proposal 8-35), stating that it would unnecessarily preclude the use of nonplug type doors above 45,000 ft. The FAA agrees that nonplug type doors can safely be used at altitudes above 45,000 ft., since adequate warning systems and door integrity are provided by § 25.783(e). Proposed new § 25.783(g) is withdrawn.

A commenter proposes that for the door whose opening would be a hazard, the door and immediate surrounding fuselage, door mechanisms, and warning system be designed for any combination of failures (including improper operation) not shown to be extremely improbable. The FAA agrees. In place of the proposals in 8-30, with regard to §§ 25.365(e) (1), (3), and (4), a rule is included to require determination by safety analysis that inadvertent opening of doors which could prevent continued safe flight and landing is extremely improbable.

Two commenters state that the criteria for passenger egress in the revision to the second sentence of § 25.783(g) (Proposal 2-59 of Notice 75-10) should be evacuation time, and not the rate of passenger egress through a given exit. The FAA agrees. Revision of the second sentence of § 25.783(g) is redesignated as § 25.783(i) and the reference to § 25.561(a) (3) in the proposal is corrected to reference § 25.561(b) (3).

Numerous negative comments concern proposed new § 25.783(j), which requires that lavatory doors open into the cabin to preclude anyone from being trapped in the lavatory. The commenters state that this requirement is overly restrictive on design and that an outward opening door could have an adverse effect on aisle width and emergency evacuation capabilities if such a door jammed open. The FAA agrees that inward opening doors can be designed to prevent anyone being trapped in a lavatory in cases of incapacitation or for other reasons. Thus, new § 25.783(j) is revised to delete the requirement that lavatory doors open into the cabin

Proposals 8-36, 2-60, and 8-37. Final action on Proposals 8-36, 2-60, and 8-37 was taken in Airworthiness Review Program, Amendment No. 8: Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Proposal 8-38. One commenter objects to adding a new § 25.792 to require a sign indicating whether lavatories are occupied, asserting that it would be inappropriate for general aircraft certificated under Part 25. Two commenters doubt that the proposed rule would achieve the objective of preventing aisle congestion near lavatories. They point out that many existing aircraft have similar signs which have not prevented people from "standing in line" for lavatories. Also, passengers can cause congestion in aisles for other reasons. One of the commenters states that lighted signs in a darkened cabin; i.e., during movies or rest periods, would annoy passengers, and that the rule might foster a proliferation of signs throughout the cabin. Finally, one commenter is concerned that any increase in the number of lighted signs might distract the passengers' attention from more essential notices.

Based on the comments and upon further review, the FAA finds that the proposed requirement would not achieve the objective sought. Accordingly, the proposal is withdrawn.

Proposal 8-39. Final action on Proposal 8-39 was taken in Airworthiness Review Program Amendment No. 8: Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Proposal 8-40. Final action on Proposal 8-40 was taken in Operations Review Program Amendment No. 8 (45 FR 41586, June 19, 1980).

Proposal 8-41. A commenter suggests that new § 25.851(a) (5), which replaces current § 25.853(f), be expanded to prescribe four fire extinguishers for a passenger capacity of 100 or more, and to require at least one CO_2, dry chemical, or all purpose fire extinguisher near lavatory and galley areas. These suggested changes are beyond the scope of the notice. However, changes in these requirements are appropriate and the FAA is conducting a research program to establish comprehensive standards and guidance information pertaining to the selection of portable fire extinguishers, taking into consideration types and quantities of extinguisher agents, extinguisher performance, and other factors. Regulatory changes based on the findings of this research program will be proposed in the next airworthiness standards review.

Sections 25.851(a) (5) and (a) (6), which consolidate hand fire extinguisher requirements, are adopted without substantive change.

Proposals 8-42, 2-18, 2-65, 2-114, and 2-160. Final action on Proposals 8-42, 2-18, 2-65, 2-114, and 2-160 was taken in Airworthiness Review Program, Amendment No. 8: Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Proposal 8-43. Final action on Proposal 8-43 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Proposal 8-44. For a discussion of proposed § 25.905(c), see the discussion under Proposal 8-103. The proposal to add a new § 25.905(c) is adopted without substantive change.

Proposals 8-45 and 8-96. The proposed amendments to §§ 25.939 and 33.65 are being deferred for consideration in a forthcoming notice of proposed rule making of the Aircraft Engine Regulatory Review Program.

Proposals 8-46, 3-35, and 8-47. Final action on Proposals 8-46, 3-35, and 8-47 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; Oct. 30, 1978).

Proposal 8-48. For an explanation of the withdrawal of the proposals concerning automatic takeoff thrust control systems, one of which is the proposal to add a new § 25.1143(f), see Proposal 8-26.

Proposals 8-49 and 3-41. Final action on Proposals 8-49 and 3-41 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; Oct. 30, 1978).

Proposal 8-50. For an explanation of withdrawal of the proposals concerning automatic takeoff thrust control systems, one of which is the addition of a new § 25.1305(c) (9), see Proposal 8-26.

One commenter objects to revising § 25.1305(d) (1), stating that significant aerodynamic forces acting on the powerplant nacelle make the direct measurement of thrust impractical. The FAA agrees that such forces may be significant. This commenter further objects to the revision, stating that it is beyond the state of the art to prohibit a parameter from being used if the accuracy of the indication will be adversely affected by any engine malfunction or damage. The FAA agrees that precise values of thrust provided by a malfunctioning, damaged, or deteriorated engine are unnecessary, provided that any changes in thrust due to engine malfunction, damage, or deterioration are indicated to the pilot. The paragraph is revised to require that the indication must be based on the direct measurement of thrust or of parameters that are directly related to thrust.

Although concurring with § 25.1305(d) (1), one commenter states that he would prefer to retain the existing requirements and delete the words ",or to indicate a gas stream pressure that can be related to thrust,". The FAA does not agree. The change suggested by this commenter would eliminate the requirement for thrust information and would retain the requirement for change-of-thrust information only. It also would provide a lower level of safety than the adopted paragraph.

This commenter also states that § 25.1305(d) (1) should be complementary to a similar requirement in Part 33 of this chapter. The FAA does not agree. In current practice, the airframe manufacturer determines how performance should be met. The choice of a means to indicate thrust is negotiated between the airplane manufacturer and the engine manufacturer. The factors which influence the final choice are substantial and may vary among airplane designs. These factors may not be known to the engine manufacturer at the time of engine type certification. Another commenter states that the need for an actual value of thrust is not obvious, whereas indication of a loss of thrust would satisfy the original proposal. The FAA agrees that the actual value of thrust is of little value to the pilot. Section 25.1305(d) (1) is revised to specify that the indicator indicate thrust, or a parameter related to thrust, to the pilot.

Proposal 8-51. No unfavorable comments were received on the proposal to change the reference in § 25.1307(h) for fire extinguishers in connection with Proposal 8-41. Accordingly, the proposal is adopted without substantive change.

Proposal 8-52. Final action on Proposal 8-52 was taken in Airworthiness Review Program, Amendment No. 8: Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Proposal 8-53. Several commenters point out a number of service deficiencies with proposed § 25.1421 which defines the requirements for cargo compartment fire detection systems. They contend that the requirement for the detection system to actuate a warning within one minute of the start of a fire is too restrictive. One commenter cites the results of FAA tests which show average fire detection times to be from 1.75 to 5 minutes. The commenters also suggest that the tests necessary to show compliance with the warning requirements are not clearly defined. Finally, one commenter points out that fires in baggage containers and other enclosed containers can burn for a considerable time before detection is likely by fire detectors in the cargo compartment.

The FAA does not concur that the one-minute requirement is too restrictive. A survey of fire detection technology has indicated that the state of the art permits detection of a fire in less than one minute after inception. In addition, current standards do not define the test procedures necessary to show compliance with warning requirements. The new one-minute requirement is intended to improve the standards in this regard.

The proposal is adopted without substantive change.

NOTE: This proposal has been carried erroneously under § 25.1421 which pertains to megaphones. It will be included in the amendment as a new § 25.858.

Proposal 8-54. Comments received from several commenters reflected confusion over the intent of proposed § 25.1439(c). It was noted that much of what was intended by proposed § 25.1439(c) is included in existing § 25.1439(a) as amended by Amendment 25-38 (41 FR 55454; 12/20/76), provided that the portable oxygen requirements of § 25.1447(c) (4) are retained. Amendment 25-38 emanated from Airworthiness Review Program Notice No. 2 (40 FR 10813; 3/7/75), and was adopted (41 FR 55468; 12/20/76) after publication of Airworthiness Review Program Notice No. 8 (40 FR 29420; 7/11/75) which contained proposals 8-54 and 8-55. The FAA agrees that the existing regulations require much of what was intended by proposal 8-54, provided that proposal 8-55 is withdrawn. The FAA further agrees that additional clarifications are needed before further amendments are made to § 25.1439. Therefore the FAA withdraws both proposals 8-54 and 8-55. The subject of protective breathing equipment will be addressed in a forthcoming notice of proposed rule making.

Proposal 8-55. The proposal to delete § 25.1447(c) (4) is withdrawn for the reasons stated for withdrawal of Proposal 8-54.

Proposal 8-56. For comments related to the proposal to revise § 25.1521(a), and for the withdrawal of that proposal, see Proposal 8-94.

Proposal 8-57. Final action on Proposal 8-57 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Proposal 8-58. For comments related to the proposal to amend § 25.1529, see Proposal 8-21.

Proposal 8-59. A commenter objects to the proposed new § 25.1557(e), calling for a placard on each flight attendant seat to indicate that it may be occupied by a flight attendant, asserting that such placarding is redundant and that a proliferation of placards in the aircraft will only serve to confuse the passengers and make all placards less effective. The commenter also states that the proposal would prohibit non-flight attendant airline personnel who are cognizant of emergency procedures from occupying flight attendant seats when the aircraft is full. The FAA concludes that a new aircraft certification rule is unnecessary to achieve this result and the proposal is withdrawn.

Proposals 8-60 and 8-61. Final action on Proposals 8-60 and 8-61 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Proposal 7-55. A commenter recommends that discrete gusts with varying gradient distances be added as a supplement to Appendix G to Part 25. The FAA disagrees because past experience with the use of discrete gusts with varying gust gradient distances has indicated that knowledge with regard to how gust intensity varies with gust gradient distance is not currently available to the designer. The research and development work accomplished in the area of dynamic response to continuous turbulence has indicated that the continuous turbulence criteria of Appendix G to Part 25 is the most rational approach currently available which gives consistent strength levels for airplanes of different characteristics and missions.

A commenter recommends that paragraph (a) of Appendix G be revised to delete the requirement for considering combined stresses based on both vertical and lateral components of turbulence. The commenter states that the current practice of combining root-mean-square stresses (shear, moment, and torsion) resulting from gust calculations involving only purely vertical or lateral components of turbulence is a realistic, practical method for combining stress. The commenter contends that the methods for realistically combining statistical load quantities involving both vertical and lateral components of turbulence have not been satisfactorily developed in the current state of the art. After further review the FAA agrees. Paragraph (a) of Appendix G is revised to delete the requirement for considering the combined stresses resulting from the vertical and lateral components of turbulence.

A commenter recommends that paragraph (b) (3) (i) of Appendix G be revised to require a gust intensity of $U\sigma = 75$ fps gust velocity in the interval 0 to 20,000 ft. altitude with a linear decrease to 30 fps at 80,000 ft. altitude. This recommendation would obviate the need to do mission analysis to justify lower levels of loads than those required to meet the design envelope gust intensity factor of 85 fps for new airplanes whose characteristics are similar to previous designs which have been shown to be adequate for the lower level of gust intensity being proposed. There is no technical need for new aircraft which are similar to existing aircraft with regard to response characteristics and basic mission profiles to make extensive mission analysis computations in order to establish their adequacy with regard to loads resulting from encounters with continuous turbulence if they are designed for the gust intensity shown to be adequate for the existing design. Therefore, it is acceptable to use a gust intensity value of 75 fps from 0 to 20,000 ft. altitude, and a linear reduction from 75 fps at 20,000 ft. to 30 fps at 80,000 ft., provided the new design is comparable to a similar design with extensive satisfactory service experience. These criteria, which have been under discussion between FAA and industry for over 10 years, are proposed as new rules rather than acceptable means of complying with existing rules. Paragraph (b) (3) (i) is revised accordingly. The commenter also recommends that paragraph (d) (1) be revised to require a gust intensity of $U\sigma = 60$ fps on the interval 0 to 20,000 ft. altitude and be linearly decreased to 23 fps at 80,000 ft. altitude. The FAA disagrees. The gust intensities in paragraph (d) (1) are based on the distribution of gust intensity with altitude which were developed in the basic research for the development of continuous turbulence criteria and are, therefore, considered reasonable as a lower design envelope limit for mission analysis. A cost analysis was provided by the commenter to justify the lower gust intensities, but the FAA finds that this cost analysis was based on "design envelope analysis" alone. Paragraph (c), which is an alternative to paragraph (b), provides for a "mission analysis". Actual experience has shown that "mission analysis," which considers airplane operational characteristics, has been used in the past in lieu of the 85 fps intensities to prevent weight and cost penalties. Paragraphs (c) and (d) of Appendix G are adopted without substantive change.

A commenter recommends that paragraph (d) of Appendix G be revised to delete the reference to "fail-safe loads" since such loads are not provided in Appendix G. The FAA agrees. Paragraph (d) of Appendix G is revised accordingly.

A commenter recommends that proposed paragraph (e) of Appendix G be deleted since acceleration levels measured at the pilot station on current conventional aircraft can be established by flight demonstration much more easily and with less cost than by use of an expensive analysis considering response to continuous turbulence. Upon further review, the FAA has determined that it lacks sufficient information to specify the right combination of analysis and flight test to determine the acceleration levels at the pilot's station during continuous turbulence. Accordingly, proposed paragraph (e) of Appendix G is withdrawn. The current requirements related to operation in turbulence are adequate to determine the response at the pilot's station during continuous turbulence.

Proposal 8-62. For comments related to the proposal to add a new Appendix G to Part 25, see Proposal 8-25. Appendix G (redesignated Appendix H) to Part 25 is adopted with the changes discussed in Proposal 8-25.

Proposal 8-63. Final action on Proposal 8-63 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Amendment to § 27.571. Because of the change to § 25.1529 adopted in this amendment, the reference to § 27.1529(a) (2) in §§ 27.571(b), (c), (d) (1), (d) (3), and (e) is no longer appropriate. The reference is changed to "§ A27.4 of Appendix A". This discrepancy was overlooked in Notice 75-31 (40 FR 29410; July 11, 1975). Since this amendment is clarifying in nature and does not impose a burden on the public, notice and public procedure are unnecessary and good cause exists for adopting this amendment.

Proposal 8-64. For comments related to the proposal to amend § 27.1529, see Proposal 8-21.

Proposals 8-65 and 8-66. Final action on Proposals 8-65 and 8-66 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Proposal 8-67. For comments related to the proposal to add a new Appendix A to Part 27, see Proposal 8-25. Additional comments on this proposal, and on the proposal to add a new Appendix A to Part 29, are discussed here.

A commenter suggests that the wording of Appendix A be adjusted to take into account the differences between airplanes and rotorcraft. The FAA agrees. The appendix, as proposed, is generally equally applicable to airplanes and rotorcraft. However, several minor changes have been made to the appendix to provide for rotorcraft differences, primarily to cover rotors and differing fatigue standards.

A commenter objects to Appendix A, contending that: (1) The standards in current §§ 27.1529 and 29.1529 have been adequate in service, and (2) the proposal is excessive in scope and would create an undue burden. The FAA does not agree, having found that recommended maintenance procedures made available to operators/owners in the past were frequently inadequate in scope and content, providing no sound basis for maintaining the airworthiness of the rotorcraft. Appendix A, with the revisions and deletions discussed above and under Proposal 8-25, would not create an undue burden on the type certificate applicant.

One commenter expresses concern that certain inspection provisions in current § 91.217 might be applied to rotorcraft. The appendix contains no such requirement. Current § 91.217 applies only to certain airplanes.

Amendment to § 29.571. Because of the change to § 29.1529 adopted in this amendment, the reference to "§ 29.1529(a) (2)" in §§ 29.571(b), (c), (d) (1), (d) (3), and (e) is no longer appropriate. For consistency, the reference is changed to "§ A29.4 of Appendix A required by § 29.1529". This change was overlooked in Notice 75-31 (40 FR 29410; July

11, 1975). Since this amendment is clarifying in nature and does not impose a burden on the public, notice and public procedure are unnecessary and good cause exists for adopting this amendment.

Proposal 2-154. For a discussion directly related to proposed new § 29.783(g), see the discussion under Proposal 8-35 for § 25.783(g) (Proposal 2-59 of Notice 75-10). Section 29.783(g) is adopted without substantive change.

Proposals 8-68 through 8-76 and 2-164. Final action on Proposals 8-68, 8-69, 8-70, 8-71, 8-72, 8-73, 8-74, 8-75, 8-76, and 2-164 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Proposal 8-77. For comments related to the proposal to amend § 29.1529, see Proposal 8-21.

Proposals 8-78 and 8-79. Final action on Proposals 8-78 and 8-79 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Proposal 8-80. For comments related to the proposal to add a new Appendix A to Part 29, see Proposals 8-25 and 8-67.

Proposal 8-81. No unfavorable comments were received on adding a new § 31.12 providing for standardized application of the airworthiness requirements for balloons. Accordingly § 31.12 is adopted without substantive change.

Proposal 8-82. No unfavorable comments were received on adding a new § 31.16 requiring that balloon empty weight be determined. Accordingly, § 31.16 is adopted without substantive change.

Proposal 8-83. No unfavorable comments were received on the intent of new § 31.17 which specifies performance in terms of an initial minimum rate of climb. However, a commenter raises the question whether compliance with proposed § 31.17(a) could be shown by testing at several altitudes and ambient temperatures and then extrapolating, by appropriate analysis, to the other values in the range for which approval is sought. The FAA considers that such extrapolation by analysis is an acceptable means of complying with proposed § 31.17(a), because the climb performance of balloons is based on fundamental principles and, therefore, can be predicted with sufficient accuracy from established test points.

The FAA notes that the 300 fpm climb rate requirement in § 31.17(a) was intended as a minimum standard. To make this clear, § 31.17 as adopted is revised by inserting the words "at least" before the number "300" in the first sentence of § 31.17(a).

Proposal 8-84. A commenter, referring to new § 31.19(a) governing critical uncontrolled descent, suggests that it would be difficult and time-consuming to determine which tear is the most critical single tear in the balloon envelope between tear stoppers. The FAA does not agree. An analysis, or a combination of test and analysis, would be an acceptable means of determining the most critical single tear. It would not be necessary to test each kind of tear. No other unfavorable comments were received on the proposal to add a new § 31.19. Accordingly, § 31.19 is adopted without substantive change.

Proposal 8-85. No unfavorable comments were received on the proposal to amend § 31.27(c) to be consistent with new § 31.19, Performance: Uncontrolled descent. Accordingly, the proposal is adopted without substantive change.

Proposal 8-86. No unfavorable comments were received on the proposal to amend § 31.65 updating the position light standards and expressing them in language consistent with related standards in other airworthiness parts. However, the FAA finds that the use of a cross reference to § 23.1397 as proposed in § 31.65(e) may be inconvenient for those governed by Part 31. Accordingly, § 31.65, as adopted, sets forth the chromaticity coordinates for aviation red and aviation white as currently prescribed in § 23.1397.

Proposal 8-87. No unfavorable comments were received on the proposal to amend § 31.71. However, after further consideration, the FAA concludes that proposed § 31.71(a) (2) is unnecessarily restrictive in that it would, in all cases, require marking the equipment as to its identification, function, *and* operating limitations. Marking of the equipment as to its identification, function, *or* operating limitations, or any applicable combination of those factors is sufficient. This is also the language used in corresponding sections of other aircraft airworthiness regulations. Section 31.71, as adopted, is revised accordingly.

Proposal 8-88. No unfavorable comments were received on the proposal to amend § 31.81 to detail operating limitations and information. The FAA notes, however, that proposed § 31.81(b) is not clear as to which "operating limitations and other information necessary for safe operation" must be furnished. The FAA's intent, as stated in the explanation, is to require that the information established under § 31.81(a) be furnished. Section 31.81(b) is revised accordingly. Section 31.81(a) is adopted without substantive change.

Proposal 8-89. A commenter is concerned that proposed § 31.82 might require balloon manufacturers to prepare two overlapping maintenance documents—the maintenance manual currently supplied to operators/owners, and the proposed Instructions for Continued Airworthiness. The FAA notes that under §§ 31.82 and 21.50(b), balloon manufacturers would be required to prepare and furnish only the Instructions for Continued Airworthiness.

The FAA notes further (as discussed under Proposal 8-21) that the Instructions for Continued Airworthiness need not be finalized until delivery of the first balloon, while § 31.82, as proposed, could be interpreted to require that they be finalized before type certification. This point is clarified in § 31.82, as adopted, consistent with the corresponding requirement in Parts 23, 25, 27, and 29.

Proposal 8-90. No unfavorable comments were received on the proposal to amend § 31.85(b) (1). However, a commenter questions whether percentage figures on the required fuel quantity gauge would be acceptable. The FAA has determined that, in the particular case of balloons (for which the fuel quantity information is to an extent less important to safety than for other classes of aircraft), calibration of the fuel quantity gauge in percent of fuel cell capacity is an acceptable means of complying with the last sentence of § 31.85(b) (1). Section 31.85(b) (1), as adopted, is revised to make this clear.

Proposal 8-91. No adverse comments were received on the proposal to add a new Appendix A to Part 31. However, comments received on the proposals to add a similar appendix to Parts 23, 25, 27, and 29 (Proposal 8-25), were equally valid with respect to this proposal. Accordingly, Appendix A to Part 31, as adopted, is revised in substance as applicable.

Regarding the proposals to require generalized repair data in the Instructions for Continued Airworthiness, it is more appropriate, as well as necessary and practicable, to include specific instructions for repair of the key elements of a balloon—the balloon envelope and its basket or trapeze. This information is incorporated in paragraph A31.3(i) as revised.

Proposal 8-92. A commenter objects to § 33.4 insofar as it would require completion of the Instructions for Continued Airworthiness before the type certificate is issued, contending that a significant portion of the data and other material called for is typically not compiled until 6 months or longer after type certification. The commenter suggests that manufacturers be allowed to prepare and make available the Instructions for Continued Airworthiness before the first aircraft equipped with the subject engine is put into service, which, it claims, is the earliest such instructions would be needed. Requiring the engine manufacturer to complete the Instructions for Continued Airworthiness before the type certificate is issued would constitute an unnecessary burden. However, the FAA considers that they must be made available, and furnished, upon delivery of the first engine on an aircraft or issuance of a standard certificate of airworthiness for the aircraft, whichever occurs later. This would be consistent with corresponding requirements proposed for other products. See Proposals 8-5 and 8-21. Section 33.4 is revised and adopted accordingly.

Proposal 8-93. A commenter observes that § 33.5 requires that the instruction manual for installing and operating the engine be "approved," whereas proposed § 33.4 requires that the Instructions for Continued Airworthiness be "acceptable to the Administrator," and recommends that the latter term be used for consistency. The FAA notes that the term "acceptable to the Administrator" is widely used in Part 43 in connection with maintenance requirements, whereas the term "approved" is more frequently used in FAR Parts containing installation and operating requirements. Considering the FAR as a whole, the FAA does not agree that such consistency is essential. Accordingly, § 33.5 is adopted as proposed.

Proposal 8-94. Several commenters object to proposed §§ 33.6(e) and (f), and to proposed §§ 23.1521(a) and 25.1521(a) (Proposals 8-20 and 8-56, respectively) on the grounds that the use of rated takeoff power or thrust for 10 minutes with one engine inoperative should not be limited to "the extent that the utilization is necessary for the airplane to avoid, without necessitating turning maneuvers, obstacles beneath the flight path intended for the airplane prior to the loss of the engine." In light of these comments and after further review, the FAA concludes that these proposals are premature and they are withdrawn.

In addition, the proposed transfer of the definitions for rated power and thrust from § 1.1 to proposed new § 33.6, Proposal 8-1, is withdrawn since the transfer may cause confusion in the administration of the aircraft certification requirements. Accordingly, Proposals 8-1, 8-20, 8-56, and 8-94 are withdrawn.

Proposal 8-95. For discussion of proposed § 33.19(b) see the discussion under Proposal 8-103. Revised § 33.19 is adopted without substantive change.

Amendment to §§ 33.55(c), 33.57(b), 33.93(b), and 33.99(b). Because of the deletion of §§ 33.5(c), (d), and (e), and the addition of a new § 33.4, the reference to "§ 33.5" in §§ 33.55(c), 33.57(b), 33.93(b), and 33.99(b) is no longer appropriate. For consistency, the reference is "§ 33.4." This change was inadvertently overlooked and was not proposed in Notice 75-31 (40 FR 29410; July 11, 1975). This editorial change corrects that discrepancy. Since this amendment is clarifying in nature and does not impose a burden on the public, notice and public procedure are unnecessary and good cause exists for adopting this amendment.

Proposal 8-97. A commenter recommends that § A33.3(a) (6) of Appendix A to Part 33 be revised by adding the words "requiring periodic attention" so as to make it clear that scheduling information is required solely for parts that require such attention. The language in this section is adequate. For parts not needing periodic attention, the applicant has only to state that parts not scheduled need not be serviced.

A commenter infers incorrectly that proposed §§ 43.16 and 91.163(c) apply only to rotorcraft. These regulations with the revision proposed also affect other classes of aircraft, as well as engines and propellers.

Some comments received on the proposed appendices for Parts 23, 25, 27, and 29 (Proposal 8-25) were equally valid with respect to proposed Appendix A to both Parts 33 and 35. Accordingly, the appendices to Parts 33 and 35 are revised in substance as applicable.

Proposal 8-98. For a discussion related to proposed § 35.3 see Proposal 8-93. A commenter observes that § 35.3 requires that the instruction manual for installing and operating the propeller be "approved," whereas § 35.4 requires that the Instructions for Continued Airworthiness be "acceptable to the Administrator," and recommends that the latter term be used for consistency. The FAA notes that the term "acceptable to the Administrator" is widely used in Part 43 in connection with maintenance requirements, while the term "approved" is more frequently used in FAR parts containing installation and operating requirements. Considering the FAR as a whole, the FAA does not agree that consistency is required in this instance. Accordingly, § 35.3 is adopted as proposed.

Proposal 8-99. In response to the concern of a commenter representing a number of Part 121 operators, the FAA notes that there is no requirement that any operator/owner use the Instructions for Continued Airworthiness referred to in proposed § 35.4. The new §§ 43.13(a), 43.16, and 91.163(c) allow the use of other methods. In particular, the use of maintenance manuals and continuous airworthiness maintenance programs developed under Parts 121, 123, 127, and 135, or an inspection program approved under § 91.217(e) would be acceptable alternatives to the Airworthiness Limitations section. This commenter suggests that language be added to proposed § 35.4 to make it clear that such alternatives may be used. The FAA agrees. The language in §§ 43.16 and 91.163(c) is revised accordingly.

Consistent with the discussion on proposed § 33.4 dealing with engines (see Proposal 8-92), the FAA finds that requiring the propeller manufacturer to complete the Instructions for Continued Airworthiness before the type certificate is issued would constitute an unnecessary burden. Accordingly, § 35.4 as adopted, requires that those instructions be made available and furnished upon delivery of the first aircraft with the propeller installed, or upon issuance of a standard certificate of airworthiness for an aircraft with the propeller installed, whichever occurs later.

Proposal 8-100. No unfavorable comments were received on the proposal to amend § 35.5 to more clearly indicate the basis for operating limitations and where they are listed. Accordingly, § 35.5 is adopted without substantive change.

Proposal 8-101. No unfavorable comments were received on the proposal to amend § 35.23 to provide an extreme low pitch indication. Accordingly, § 35.23 is adopted without substantive change.

Proposal 8-102. A commenter does not concur with the proposal to revise § 35.37 to require evaluation of metallic hubs and blades, stating that the words "must", "all", and "reasonably foreseeable" in the second sentence imply responsibility beyond current knowledge and the state of the art. The FAA does not agree. These terms are used in the current rule and the current state of the art defines the limits of the provision.

The same commenter recommends that § 35.37 be revised to apply to consideration of "normal and reasonably foreseeable load patterns," to account for the fact that only normal operations will or should be considered. The FAA does not agree. Load patterns which are reasonably foreseeable are critical and should be investigated even if they are not normal.

The same commenter also indicates that the third sentence should be revised to eliminate the term "reduction factors," since reduction factors are identified with only one particular method of presentation. The FAA agrees and the section is revised accordingly. This commenter finally states that the explanation implies that manufacturers have not taken permissible damage and material variation into account. This implication is not intended. It is the FAA's view that the fatigue evaluation should consider the occurrence of typical service damage and variation in material properties and the rule would provide for such an evaluation.

Another commenter suggests that the section be revised by adding certain technical requirements that are related to infinite component life. It is not necessary to specify requirements concerning infinite component life, since they are considered a normal part of propeller fatigue testing.

Section 35.37 is adopted as revised.

Proposal 8-103. A commenter objects to the proposal to add a new § 35.42 to define durability requirements for propeller blade pitch control system components, stating that the term "bench tests" in §§ 35.42(a) and (b) is too descriptive and restrictive. The FAA agrees that a reference to "bench tests" may be too restrictive. Other test methods may be equally acceptable in providing the necessary data. Accordingly, §§ 35.42(a) and (b) are revised to eliminate the specific reference to "bench."

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The commenter also suggests that the words "in frequency and amplitude" be eliminated from § 35.42(a) since the words "cyclic testing" are fully descriptive. The FAA believes that these words are needed to prescribe key elements in the required test.

The commenter further suggests that the proposed testing to the equivalent of 1,000 hours of propeller operation is too restrictive in the case of a propeller with an overhaul period of less than 1,000 hours. The FAA considers the specific testing to be the minimum necessary to provide an acceptable safety level in service. The rule does not, however, prevent the selection of overhaul intervals of less than 1,000 hours.

Finally, the commenter suggests that the rule should permit an alternate of acceptance based upon service experience. The FAA recognizes that service experience can provide a statistical basis for determining component reliability. Its applicability, however, may vary according to such considerations as type of operation, the nature of the article under consideration, the degree of similarity between the reference article and the certification article, and the completeness of service records. Since it is dependent on such a variety of factors, the FAA does not agree that a specific alternative based on service experience should be included.

The proposal to add a new § 35.42, therefore, is adopted with the change discussed below. No adverse comments were received on the related proposed revisions to §§ 23.905, 25.905, and 33.19 to add the reference to new § 35.42, and the revisions are adopted.

Proposal 8-104. For comments related to the proposal to add a new Appendix A to Part 35, see Proposals 8-25 and 8-97.

A commenter objects to proposed § A35.1(c) of the appendix because the propeller owner (aircraft operator) would be wastefully provided with instructions and data that the propeller owner has no authority to use. The FAA does not agree. The Instructions for Continued Airworthiness must be furnished to the aircraft owner/operator who is the person responsible for maintaining the aircraft (including the propeller). The owner/operator may not be authorized to maintain the propeller, but the owner/operator can place the instructions in the hands of persons who are authorized.

The new Appendix A to Part 35, as adopted, is revised in accordance with comments discussed in Proposal 8-97.

Proposal 8-105. The proposed revision of § 43.9(a)(4) is being deferred for consideration in a forthcoming notice of proposed rule making of the Operations Review Program.

Proposal 8-106. A commenter representing a number of scheduled air carriers is concerned that the use of maintenance manuals and continued airworthiness programs developed under current § 121.133 and Subpart L of Part 121 (generally via Maintenance Review Board procedures), or under similar provisions of Parts 127 and 135, might not be acceptable as "other methods, techniques, and practices" under the terms of proposed § 43.13(a). This commenter suggests that language be added to proposed § 43.13(a) to make this clear. The FAA does not agree. The proposed language states that the use of such manuals and continued airworthiness programs is acceptable.

Proposal 8-107. A commenter representing a number of scheduled air carriers recommends that the Airworthiness Limitations section referred to in proposed § 43.16 include life limitations only and not inspections or other maintenance items. As discussed under Proposal 8-3, the FAA does not agree.

A commenter suggests that the words "or other methods, techniques; and practices acceptable to the Administrator" be added at the end of proposed § 43.16 to make it consistent with proposed § 43.13(a). The Airworthiness Limitations section contains specific mandatory replacement times and inspection intervals (with related procedures) that must be complied with, unless it can be shown by an operator with an approved maintenance program that these times are inappropriate for his operation. The use of alternatives not covered in the Airworthiness Limitations section would be allowed if approved by the Administrator. Section 43.16 is revised to specifically state the alternatives to compliance with the Airworthiness Limitations section.

Proposal 8-108. No unfavorable comments were received on the proposal to amend § 45.11 to qualify, with respect to manned free balloons, the requirements in § 45.11(a) that deal with the location of the identification plate. Accordingly, the proposal is adopted without substantive change.

Proposal 8-109. No unfavorable comments were received on the proposal to amend § 45.13 to correctly reference §§ 45.11(a) and (b) with regard to identification plate requirements. Accordingly, the proposal is adopted without substantive change.

Proposal 8-110. A commenter representing a number of scheduled air carriers recommends that the words "inspection interval, or related procedure" be deleted from proposed § 45.14. The supporting rationale is the same as submitted by this commenter concerning Proposal 8-3 to amend § 21.31(c). As discussed under Proposal 8-3, the FAA disagrees.

The language in § 45.14 covers rotorcraft as well as airplanes, balloons, engines, and propellers. To make this clear, the word "Rotorcraft" is changed to "Manufacturer's".

Two commenters object to proposed § 45.14 on the grounds that it would be impracticable to mark small parts with a part and serial number. The FAA is not aware that the marking of small parts under current § 45.14 has presented a problem. In any event, the rule allows markings that are equivalent to part and serial numbers, such as symbols enabling the identification of the part as one for which a replacement time, inspection interval, or related procedure is specified in an Airworthiness Limitations section. Identification of such parts is clearly essential for safety. Accordingly, § 45.14 is adopted as revised.

Proposal 8-111. A commenter representing a number of scheduled air carriers recommends that the words "inspection interval, or related procedure" be deleted from proposed § 91.163(c). The supporting rationale is the same as that submitted by this commenter concerning Proposal 8-3 to amend § 21.31(c). As discussed under Proposal 8-3, the FAA disagrees. However, § 91.163(c) is revised to specifically identify the acceptable alternatives to compliance with the "Airworthiness Limitations" section.

The language in proposed § 91.163(c) covers rotorcraft as well as airplanes, balloons, engines, and propellers. To make this clear, the word "Rotorcraft" in § 91.163(c) has been changed to "Manufacturer's", and a statement has been added that operations specifications approved by the Administrator may be used in lieu of the Instructions for Continued Airworthiness. Section 91.163(c) is adopted as revised.

Proposal 8-112. No unfavorable comment was received on the proposal to amend § 91.165 to clarify maintenance personnel entries in maintenance records. Accordingly, the proposal is adopted without substantive change.

Proposal 8-113. Several commenters object to §§ 91.173(a)(2)(i) and (iii). A commenter states that adoption of the proposal would result in an inconsistency between § 91.173 and § 121.380, which contains the recordkeeping requirements for aircraft maintained under Part 121. The commenter also states that this inconsistency would cause great difficulty and economic hardship whenever an aircraft is sold by a Part 121 operator to a Part 91 operator and the Part 91 aircraft is maintained by a Part 121 operator under its repair station certificate. According to the commenter, the economic hardship would occur to both the Part 91 operator and the repair station. The same commenter contends that reliability information accumulated in recent years on transport category airplanes shows that there is no need for individualized total time records on equipment and components. Another commenter states that proposed requirements would result in large increases in maintenance costs for Part 91 operators and that only those components that are life-limited should have to carry total times.

The FAA concludes, however, that revision of § 91.173(a)(2)(i) would contribute significantly to safety with little burden on those affected. The currently prescribed record of total time in service for the airframe does not generally apply to the aircraft's engines or propellers, since these components are frequently overhauled (or replaced) at different times. As a practical matter, it is known that operators of such aircraft normally keep records from which the total time in service of engines and propellers can be derived. Therefore, the FAA does not agree that the requirement to keep total times on engines and propellers would be a hardship and burden upon the operators. Accordingly, § 91.173(a) (2) (i) is adopted without change.

In light of the comment on proposed § 91.173(a) (2) (iii), the FAA has given further review of the proposal and has concluded that existing requirements satisfy the objective of the proposal. Accordingly proposed § 91.173(a) (2) (iii) is withdrawn.

The reporting and recordkeeping requirements contained in § 91.173 have been approved by the Office of Management and Budget in accordance with the Federal Reports Act of 1942.

Proposal 8-114. Several commenters agree with the intent of proposed § 91.193(c) (4) but suggest changes. A commenter suggests that the proposed installation instructions for hand fire extinguishers would be more appropriately placed in the type certification rules. The FAA does not agree. New type certification rules do not apply to aircraft already in service.

A commenter suggests that the words "unless obvious" be added to clarify when the hand fire extinguisher stowage provisions must be properly identified. The FAA agrees. Proposed § 91.193(c) (4) is revised and adopted accordingly.

Proposal 8-115. One commenter objects to the proposal to revise § 91.197(a) to require passenger information signs to meet the requirements of § 25.791. The commenter states that it is unnecessary, in many small general aviation aircraft operating under Subpart D of Part 91, to have such signs just for the sake of uniformity. The commenter also states that "nonstandard" signs now in use are wholly adequate to meet the needs of the type of operation. Finally, the commenter points out that installation costs for aircraft not currently having signs would be high and the pilot could just as easily announce the information as he could activate the signs.

Based on these comments and considering the type of operation involved, the FAA finds that the benefits associated with the proposal do not warrant its adoption. The proposal to revise § 91.197(a) is withdrawn.

Proposals 8-116, 8-117, 8-118, and 8-119. Final action on Proposals 8-116, 8-117, 8-118, and 8-119 was taken in Airworthiness Review Program, Amendment No. 8: Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Proposal 8-120. In light of the need to conduct further testing of protective breathing equipment, the FAA withdraws its proposal to amend § 121.337, which will be addressed in an upcoming notice of proposed rule making.

ADOPTION OF THE AMENDMENT

Accordingly, Parts 11, 21, 23, 25, 27, 29, 31, 33, 35, 43, 45, and 91 of the Federal Aviation Regulations are amended, effective October 14, 1980.

(Sections 313(a), 601, 603, and 604 of the Federal Aviation Act of 1958 (49 U.S.C.1354(a), 1421, 1423, and 1424)); and Section 6(c) of the Department of Transportation Act (49 U.S.C.1655(c)))

The FAA has determined that this document involves a regulation which is not significant under Executive Order 12044, as implemented by Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). A copy of the final evaluation prepared for this document is contained in the docket. A copy of it may be obtained by writing to the individual and address listed in the "For Further Information Contact" paragraph.

Amendment 21-52

Operating Limitations and Related Requirements for Certain Propeller-Driven, Small Airplanes Designed for Agricultural Aircraft Operations or Fire Fighting Purposes

Adopted: September 30, 1980 **Effective: November 10, 1980**

Applicability date: **For operation of affected airplanes that do not have flight time, as specified, before January 1, 1980, and for which certificates and approvals are issued after the effective date of this rule.**

(Published in 45 FR 67064, October 9, 1980)

SUMMARY: This amendment prescribes requirements governing operation of certain propeller-driven, small airplanes, that are excluded from the applicability of noise level rules because they are designed for agricultural aircraft operations or for dispensing fire fighting materials. It applies to operation of newly produced airplanes (without flight time before January 1, 1980), and acoustically changed airplanes (without flight time in the changed design before January 1, 1980), that have not been shown to comply with Part 36 noise levels. It prohibits operation of the affected airplanes except for those operations that are directly associated with the work activity for which they are designed. The amendment also requires that an operating limitation be appropriately provided to the pilot. Under the amendment, on and after its effective date, the FAA will not issue an original standard airworthiness certificate or approve any "acoustical change" of those airplanes unless the operating limitation is provided as required. Experience indicates that this amendment is needed to ensure that the affected newly produced and acoustically changed aircraft that take advantage of the agricultural and fire fighting exception in the noise certification rule, are not used for purposes for which the exception was not intended.

FOR FURTHER INFORMATION CONTACT:

Mr. Richard N. Tedrick, Noise Policy and Regulatory Branch (AEE-110), Noise Abatement Division, Office of Environment and Energy, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591; telephone (202) 755-9027.

SUPPLEMENTARY INFORMATION:

REGULATORY HISTORY

This amendment is based upon a Notice of Proposed Rule Making (Notice No. 76-27) published in the FEDERAL REGISTER on December 23, 1976 (41 FR 56065). As discussed in that Notice, it was issued in response to the U.S. Environmental Protection Agency's (EPA) recommended noise regulations for propeller-driven, small airplanes (adopted in part under amendments also published in the FEDERAL REGISTER on December 23, 1976 (41 FR 56065)). Pursuant to § 611(b) of the Federal Aviation Act of 1958, as amended, the FAA has consulted with the Secretary of Transportation and EPA concerning this amendment.

BACKGROUND

Part 36 of the Federal Aviation Regulations (FAR) contains noise standards for type design and airworthiness certification, and approvals of acoustical changes of certain propeller-driven, small airplanes. Those standards, contained in Subpart F and Appendix F of Part 36, do not apply to airplanes designed for agricultural aircraft operations (as defined in FAR § 137.3, effective January 1, 1966) or for dispensing fire fighting materials (see, § 36.1(a)(2)). Complementary procedural provisions are prescribed in §§ 21.93(b) and 21.183(e)(2) of FAR Part 21.

For aircraft in those two classes, the rules permit certification and changes in certification without showing compliance with the noise limits under Appendix F. However, the environmental impact of the exclusion is minimized for aircraft in the restricted category because those aircraft are subject to FAR § 91.39 which prohibits operations other than those necessary for the accomplishment of the work activity for which the restricted category airplanes were designed. That limitation does not apply to agricultural and fire fighting airplanes that are type certificated in categories other than restricted and, thus, have standard airworthiness certificates. That allows those propeller-driven, small airplanes with standard airworthiness certificates to engage in operations not related to the accomplishment of agricultural or fire fighting activities even though they were excepted from Part 36 noise requirements solely because of the strong public interest in agricultural and fire fighting activity. This has the potential for circumventing the reason for the limited exception for agricultural and fire fighting airplanes in § 36.1(a)(2).

Therefore, the FAA proposed this amendment to limit operation of utility, acrobatic, and transport category airplanes that take advantage of that exception to those associated with the work activity for which they were designed. The affected airplanes, under this amendment, may still engage in operations other than those directly associated with the activity for which they were designed but only if they, like other propeller-driven, small airplanes, have been shown to comply with the otherwise applicable noise standards of Appendix F of Part 36. This rulemaking also amends the certification procedures in Part 21 and the noise regulation in Part, 36, to reflect the new operating limitation under new § 91.56 under Part 91. Those amendments to §§ 21.93(b) and 21.183(e)(2) govern the original issuance of standard airworthiness certificates and acoustical change approvals for the affected airplanes that do not have flight time before January 1, 1980. Under the rule, those certificates will not be issued and those approvals will not be given after the effective date of this rule unless the statement required under FAR § 36.1583 is provided. Those changes are discussed in more detail in the "section-by-section analysis," below.

DISCUSSION OF COMMENTS

Interested persons were invited to participate in this rulemaking proceeding by submitting their written comments to the regulatory docket on or before February 28, 1977. Due consideration has been given to the two comments received in the regulatory docket regarding Notice No. 76-27.

One commenter expressed concern about the proposal as it affects airplanes designed for agricultural purposes that are type certificated in categories other than restricted, and that have been excepted under § 36.1(a)(2). The commenter stated that there may be a need or desire to type certificate such aircraft in the normal category for sale in the United States, as well as for export. The FAA agrees. This amendment does not prohibit manufacturers from certificating an affected airplane in the normal category if they should choose to do so. However, for airplanes without flight time before January 1, 1980, that have not been shown to comply with Part 36 noise standards, this amendment imposes an operating limitation that precludes their use in the United States for other than the purpose for which their certification was approved.

The EPA submitted a comment supporting this amendment for the reasons stated in proposing the rule.

EVALUATION OF IMPACTS

The economic and technological impacts of this amendment have been considered pursuant to § 611(d) of the Federal Aviation Act of 1958, as amended. Since this amendment only limits the use of a small number of airplanes to the agricultural and fire fighting operations for which they were designed, its regulatory and economic impact is minor. In deciding whether to purchase or modify an airplane covered by the rule, the operator should consider the impact of limiting the operation of the airplane to its special purpose. That restriction is the reasonable consequence of operating an airplane which has not been shown to meet the otherwise applicable noise level requirements. One anticipated consequence is an increased incentive to show, whenever possible, that the airplane complies with those requirements rather than accept the operating limitation. Such a result is fully consistent with the noise control objectives of § 611 of the FA Act.

The environmental benefit of this rule is the limiting of a small class of agricultural and fire fighting airplanes to those operations for which they are designed (unless they comply with the otherwise applicable noise standards). This will result in slight reductions in noise exposure, but should have little or no effect on aircraft emissions or fuel consumption compared with the effects of current rule.

SECTION-BY-SECTION ANALYSIS

Part 21. Part 21 contains the procedures for the certification of products and parts. Subparts D and H of Part 21 prescribe procedures that govern the FAA approval of changes to type certificates and issuance of airworthiness certificates, respectively. Section 21.93 governs the different classes of type certificate changes. For propeller-driven, small airplanes in the normal, utility, acrobatic, transport, and restricted categories, § 21.93(b) (3) defines those changes in type design that are "acoustical changes" (and that must, therefore, be shown not to increase the noise levels of the airplanes above specified limits). The applicability of "acoustical change" provisions currently exclude "airplanes that are designed for 'agricultural aircraft operations' . . . or for dispensing fire fighting materials." Section 21.183(e) (2), concerning original issue of standard airworthiness certificates, contains an identical exclusion. The effect of those exclusions is that any type design change, which would otherwise be an 'acoustical change' may be approved and standard airworthiness certificates may be issued for those special purpose airplanes without showing compliance with the otherwise applicable noise standards for propeller-driven, small airplanes. The FAA has found that those exclusions are warranted by the strong public interest in agricultural and fire fighting aircraft operations and the need for high power levels for the safe conduct of those operations. However, aircraft excepted from compliance with Part 36 solely because of their agricultural and fire fighting capabilities should be limited to activities related to agricultural and fire fighting operations. Thus, under this amendment to Part 91, in order to conduct operations not related to agricultural and fire fighting operations, those airplanes are required to comply with the noise limits that apply to airplanes that do not qualify for the exclusion.

Notice No. 76-27 did not expressly propose to regulate the original issue of standard airworthiness certificates as it did acoustical change approvals. However, since under the amendment noncomplying airplanes certificated in the categories that have standard airworthiness certificates cannot be operated in the United States if the airplane did not have flight time before January 1, 1980, FAA's original issuance of a standard airworthiness certificate could be misunderstood as authorizing operation contrary to the prescribed operating limitation. Thus, this amendment includes amendments to §§ 21.93(b) and 21.183(e) (2) to reflect the Part 21 operating limitation by precluding FAA issuances and approvals covered by those sections for the affected airplanes unless the operating limitation required under § 36.1583 is provided. By so doing, the regulation of the issuance of the type certificates is unnecessary since the operator of each affected airplane will have been provided the applicable operating limitation. Notice No. 76-27 proposed to add the words "and for which no requirements are prescribed in Part 36 of this chapter" to reflect the limitation on the operation of those airplanes provided in the required operating limitation under § 36.1583. The intent and significance of that addition is clarified in this amendment by express reference to the applicability of § 36.1583 requirements, including flight time before January 1, 1980, rather than to Part 36 generally.

In Amendment 36-7 (42 FR 12360; March 3, 1977), the acoustical change provisions for propeller-driven, small airplanes were redesignated as § 36.9. Inadvertently, the cross reference to those provisions under § 21.115(a) was not also changed at that time to fully reflect for the effects of Amendment 36-7. Thus, § 21.115(a) is editorially amended to achieve that result.

Part 36. Part 36 contains noise standards for the certification of aircraft. This amendment changes the applicability of Part 36 noise standards concerning the issuance of changes to type certificates (acoustical changes) and original standard airworthiness certificates for the affected propeller-driven, small airplanes. Thus, § 36.1(a) (2) is amended to reflect the applicability of Part 36, to those agricultural and fire fighting propeller-driven, small airplanes to which the Part 36 operating limitation provisions apply.

Subpart G of Part 36 contains operating limitations and information requirements for aircraft certificated under Part 36. In part, the purpose of operating limitations issued under Subpart G is to establish, during certification of the airplane, noise related requirements that must later be complied with by the operator of the airplane. As proposed in the notice, this amendment adds a new § 36.1583, entitled "[n]oncomplying agricultural and fire fighting airplanes." This new section provides that a specified statement must be provided in each noncomplying airplane that does not have flight time before January 1, 1980 (for newly produced airplanes), for flight time before January 1, 1980, in the changed configuration (for acoustically changed airplanes). The statement indicates that the airplane has not been shown to comply with the applicable noise limits in FAR Part 36 and must be operated in accordance with FAR § 91.56. That statement must be furnished in the manner prescribed in § 36.1581, which specifies the conditions under which information must be furnished in the approved portion of the Airplane Flight Manual or in other approved manual material, markings, or placards. Under the rule before this amendment, the only information required to be furnished under § 36.1581 is that approved under § 36.1501. The statement required by new § 36.1583 is in addition to that information. To assure consistency, § 36.1581 is also amended by adding a reference to the statement required by § 36.1583. It should be noted that the operating limitation will be required by § 36.1583 only for airplanes for which an original issue standard airworthiness certificate is issued or an acoustical change approval is given after the effective date of this amendment.

Part 91. This amendment adds a new § 91.56 to Subpart A of Part 91, the general rules that govern the operation of aircraft. In a manner similar to the rules for restricted category aircraft in § 91.39, new § 91.56 requires that agricultural and fire fighting, propeller-driven, small airplanes (having standard airworthiness certificates) that have not been shown to comply with the noise limits in Part 36, may not be operated except as specified. Three situations are provided which prescribe how the noncomplying airplane may be used—(1) to the extent necessary to the work activity directly associated with the agricultural or fire fighting purpose for which it is designed; (2) to provide flight crewmember training in the "special purpose operation for which the airplane is designed"; and (3) to conduct "nondispensing aerial work operations" in accordance with the requirements under § 137.29(c) of Part 137. Aircraft operations between bases of operation and work sites for the sole purpose of conducting the special purpose operation (and returning) are considered under the rule as part of the permissible "work activity."

ADOPTION OF THE AMENDMENT

Accordingly, Parts 21, 36, and 91 of the Federal Aviation Regulations (14 CFR Parts 21, 36, and 91) are amended, effective November 10, 1980.

(Sec. 307(c), 313(a), 601(a), and 611(b), Federal Aviation Act of 1958, as amended (49 U.S.C. §§ 1348(c), 1354(a), 1421, and 1431(b)); Sec. 6(c), Department of Transportation Act (49 U.S.C. § 1655(c)); Title I of the National Environmental Policy Act of 1969 (42 U.S.C. § 4321, et seq.); and Executive Order 11514, March 5, 1970.)

NOTE: The Federal Aviation Administration has determined that since this document involves a regulation based on a notice of proposed rulemaking issued before the effective date of the Department of Transportation Regulatory Policy and Procedures (44 FR 11034; February 26, 1979) implementing Executive Order 12044, the Department of Transportation Order does not apply. Further, this document does not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Order 11821 or 11949 or OMB Circular A-107, which were superseded by Executive Order 12044.

Amendment 21-51A

Airworthiness Review Program; Amendment No. 8A: Aircraft, Engine, and Propeller Airworthiness, and Procedural Amendments; Correction

Adopted: December 19, 1980 **Effective: December 29, 1980**

(Published in 45 FR 85597, December 29, 1980)

SUMMARY: These amendments correct certain minor omissions and typographical errors noted in Airworthiness Review Program No. 8A, Amendment Nos. 11-20, 21-51, and 45-12. These amendments are necessary to express correctly the FAA's intended statement of the rules, and to publish the correct effective date for new § 21.50(b).

FOR FURTHER INFORMATION CONTACT: Marvin J. Walker, Regulatory Review Branch, AVS-22, Safety Regulations Staff, Associate Administrator for Aviation Standards, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, D.C. 20591, Telephone: (202) 755-8714.

SUPPLEMENTARY INFORMATION: On September 11, 1980, Amendment Nos. 11-20 (45 FR 60170), 21-51 (45 FR 60170), and 45-12 (45 FR 60183) were published in the FEDERAL REGISTER. A review of those amendments shows that there were minor typographical errors and omissions, and that immediate amendments are needed to correct the amendments. The reasons for each of the amendments are explained below:

1. Section 11.49. There were two omissions and one typographical error in this section. Section "11.49(b) (4)" should be "11.49(b) (3)", and the words "is delegated" should be inserted after the word "chapter" in § 11.49(b) (3) to be internally consistent with § 11.49(b). The period at the end of § 11.49(b) (2) is replaced by a semicolon and the word "and".

2. Section 21.50. In § 21.50(b) the date "October 14, 1981" was a typographical error. Consistent with Notice 75-31 (40 FR 29412) the date should have been October 14, 1980 (the effective date of Amendment 21-51). In order to give the notice required by the Administrative Procedure Act, the date has been amended to "January 28, 1981" (30 days after effective date of this amendment).

3. Section 45.11. In § 45.11(a) the reference to § 43.13 was a typographical error. The reference to § 43.13 should be § 45.13.

Since these amendments are clarifying and editorial in nature and implement changes required to carry out the intent of amendments to Parts 11, 21, and 45, and impose no additional burden on any person, I find that notice and public procedure are unnecessary and that good cause exists for making them effective in less than 30 days.

THE AMENDMENTS

Accordingly, Parts 11, 21, and 45 of the Federal Aviation Regulations are amended effective December 29, 1980.

Sections 313(a), 601, 603, and 604, Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, and 1424); section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

NOTE: The FAA has determined that this document involves a regulation which is not significant under Executive Order 12044, as implemented by DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). Since this regulatory action involves amendments that are corrective and editorial in nature, and does not modify the substance of the regulation contemplated under the final rule, the anticipated impact is so minimal that it does not warrant preparation of a regulatory evaluation.

Amendment 21-52A

Operating Limitations and Related Requirements for Certain Propeller Driven Small Airplanes Designed for Agricultural Aircraft Operations or Fire Fighting Purposes; Correction

Adopted: November 20, 1980 Effective: November 10, 1980

(Published in 45 FR 79009, November 28, 1980)

SUMMARY: On October 9, 1980, the FAA published its final rule prescribing requirements relating to certification and operation of certain propeller-driven, small airplanes designed for agricultural aircraft operations or fire-fighting purposes (45 FR 67064). That action included an amendment to § 21.115(a), as discussed in the preamble. However, on 45 FR 67066 in the statement of Amendment No. 2, it inadvertently indicated that paragraph (c) of § 21.115 was being amended rather than paragraph (a). Efforts to correct that error before it was published were not successful. Accordingly, this action makes the necessary correction, effective November 10, 1980, the effective date of the final rule.

FOR FURTHER INFORMATION CONTACT:

Mr. Richard N. Tedrick, Noise Policy and Regulatory Branch (AEE-110), Noise Abatement Division, Office of Environment and Energy, Federal Aviation Administration, 800 Independence Ave., SW., Washington, D.C., 20591; telephone (202) 755-9027.

SUPPLEMENTARY INFORMATION:

Since this amendment to the final rule is corrective in nature to reflect the intended amendment as discussed in the preamble to the final rule, I find that further notice and public procedure thereon is unnecessary and that good cause exists for making it effective in less than 30 days after its publication in the FEDERAL REGISTER.

ADOPTION OF THE AMENDMENTS

Accordingly, § 21.115(a) of the Federal Aviation Regulations (14 CFR 21.115(a)) is amended effective November 10, 1980, by deleting the words "§ 36.7" and substituting for them the words "§§ 36.7 and 36.9."

(Secs. 307(c), 313(a), 601(a), and 611(b), Federal Aviation Act of 1958, as amended (49 U.S.C. §§ 1348(c), 1354(a), 1421, and 1431(b)); Sec. 6(c), Department of Transportation Act (49 U.S.C. § 1655(c)); Title I, National Environmental Policy Act of 1969 (42 U.S.C. § 4321, et seq.); and Executive Order 11514, March 5, 1970).

NOTE: The FAA has determined that this document involves a regulation which is not significant under Executive Order 12044, as implemented by DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). Since this regulatory action involves amendments that are corrective and editorial in nature and do not modify the substance of the regulation contemplated under the final rule, the anticipated impact is so minimal that it does not warrant preparation of a regulatory evaluation.

Amendment 21-53

Type Certification Procedures for Gliders

Adopted: January 12, 1981 **Effective: January 15, 1981**

(Published in 46 FR 3494, January 15, 1981)

SUMMARY: This amendment provides a revision to the procedural rules for the type certification of gliders (including sailplanes) to permit equivalency findings with respect to the applicable airworthiness standards as is now permitted in the type certification of other aircraft. These procedural rules would also be applicable to the type certification of fixed-wing, self-launching (powered) gliders. This updating of the Federal Aviation Regulations eliminates an inconsistency in the regulations and, without any derogation of safety, an unnecessary economic burden which was previously imposed on this segment of sport aviation.

FOR FURTHER INFORMATION CONTACT:

Mr. Marvin Walker, Regulatory Review Branch (AVS-22), Safety Regulations Staff, Associate Administrator for Aviation Standards, 800 Independence Avenue, SW., Washington, D.C. 20591. Telephone (202) 755-8714.

SUPPLEMENTARY INFORMATION:

This amendment is based on Notice 80-17 which was published in the FEDERAL REGISTER on October 14, 1980 (45 FR 67677) and revises the procedural rules in § 21.23 of the Federal Aviation Regulations (FAR) for the type certification of gliders.

Section 21.23 of the Federal Aviation Regulations (FAR) provided that an applicant is entitled to a type certificate for a glider if the applicant submits the type design, test reports, and computations necessary to show that the glider meets the applicable regulations and there is no unsafe feature or characteristic of the glider. The applicable regulations were defined in § 21.23(a) to be those airworthiness requirements of Part 23 or Part 27 of the FAR that the Administrator finds to be (1) appropriate for gliders and (2) applicable to the applicant's specific type design. No provisions were made for gliders which may not meet all of the applicable airworthiness requirements of Part 23 or Part 27, although the provisions not compiled with are compensated for by factors in the glider's type design that provide an equivalent or greater level of safety. The procedural requirements for the type certification of gliders were unique in this respect. The type certification procedures applicable to all other aircraft specifically provide for such equivalency, and there did not appear to be any justification for the restriction against the use of designs which provide an equivalent level of safety with respect to certification of basically a sport aircraft operated for pleasure and not for compensation or hire.

Accordingly, the FAA proposed to amend § 21.23(a) to permit the issuance of type certificates for gliders (including sailplanes), including fixed-wing, self-launching (powered) gliders, that comply with either the applicable airworthiness requirements of Part 23 or 27 of the Federal Aviation Regulations or such other airworthiness criteria that provide an equivalent level of safety to those requirements.

Specifically, this amendment permits the development and use of comprehensive and detailed criteria for the type certification of gliders, provided the Administrator finds that to the extent the criteria does not meet the applicable airworthiness requirements of Part 23 or Part 27, it provides an equivalent level of safety to those requirements. Simultaneous with the issuance of this amendment, the FAA is issuing new Advisory Circular (AC) No. 21.23-1 to approve two comprehensive and detailed criteria, but not the only criteria, that may be used by an applicant for the type certification of fixed-wing gliders (sailplanes), including self-launching gliders. A draft of AC 21.23-1 was published in the Federal Register (45 FR 67818) for comment on October 14, 1980, along with NPRM 80-17.

AC 21.23-1 identifies the European Joint Airworthiness Requirements (JAR-22) for Sailplanes and Powered Sailplanes, when supplemented by certain FAA criteria, as acceptable criteria for the type certification of gliders pursuant to § 21.23 as amended. This amendment, together with the issuance of AC 21.23-1, is responsive to a petition for rulemaking filed by the Soaring Society of America requesting FAA to adopt JAR-22.

Discussion of Comments

All commenters expressed agreement with the proposals contained in Notice 80-17. Many commenters simultaneously commented on the draft AC 21.23-1. Comments on the AC were outside the scope of Notice 80-17, but were considered in the development of the final AC.

One commenter questions the reference to Part 27 in § 21.23(a). Section 21.23(a) previously referenced Part 27 to provide a basis to type certificate rotary wing gliders and the reference is retained in new § 21.23(a) for that purpose.

Planned Glider Engine and Propeller Rule Making

The preamble of NPRM 80-17 stated that Part 33 and 35 of the regulations contains the certification requirements for engines and propellers, to be installed in gliders, i.e., self-launching (powered) gliders. New AC 21.23-1 provides criteria for approving engines and propellers as an integral part of the glider. This criteria has been found by the FAA to meet the applicable requirements of Parts 33 and 35 or to provide an equivalent level of safety to those requirements not complied with when approved as an integral part of a glider that meets the criteria in the AC. Such an approval does not constitute certification of the engine or propeller for installation on other gliders. The FAA plans to initiate rule making in the near future to add new Subparts to both Part 33 and Part 35 to establish specific requirements for the general type certification of glider engines and propellers. JAR-22, Subparts H and J, will be used as the basis for the proposed rule making.

Adoption of the Amendment

Since this rule imposes no burden on any person, allows alternate methods of compliance with established airworthiness standards and is in consonance with the spirit of Executive Order 12044, I find that good cause exists to make these amendments effective immediately. Accordingly, Part 21 of the Federal Aviation Regulations is amended effective January 15, 1981.

(Sections 313(a), 314, 601, 603, 604, 610, and 611 of the Federal Aviation Act of 1958, as amended (49 U.S.C. §§ 1354(a), 1355, 1421, 1423, 1424, 1430, and 1431); and section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)); and 14 CFR Part 11.)

NOTE.—The FAA has determined that this document involves a regulation which is not significant under Executive Order 12044, as implemented by the Department of Transportation Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). A copy of the draft regulatory evaluation prepared for this action is contained in the regulatory docket. A copy may be obtained by contacting the person identified above under the caption: "For Further Information Contact." Moreover, it has been determined that this rule will not have a significant economic impact on a substantial number of small entities.

This rule is a final order of the Administrator as defined by Section 1005 of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1485). As such, it is subject to review only by the courts of appeals of the United States or the United States Court of Appeals for the District of Columbia.

Amendment 21-54
Special Flight Permits

Adopted: July 1, 1981 **Effective: July 23, 1981**

(Published in 46 FR 37876, July 23, 1981)

SUMMARY: This amendment extends the eligibility for special flight permits with continuing authorization to all aircraft operated under the air taxi and commercial operator rules in Part 135 that are maintained under continuous maintenance programs. This action further implements the recent major change to Part 135 which requires certain aircraft to be maintained under continuous airworthiness maintenance programs; and grants to Part 135 operators the same benefits already accorded to certificate holders under Parts 121 and 127. Under the amended rule, operators of affected aircraft under Part 135 will be relieved of many economic burdens associated with excessive maintenance downtime and of administrative burdens imposed by the prior requirement for individual flight permits or regulatory exemptions. This regulatory change is in full accord with Executive Order 12291 in reducing the burden of existing and future regulations.

FOR FURTHER INFORMATION CONTACT:

Mr. Dan Keenan, Regulatory Projects Branch (AVS-22)
Safety Regulations Staff
Associate Administrator for Aviation Standards
Federal Aviation Administration
800 Independence Avenue, S.W.
Washington, D.C. 20591; Telephone (202) 426-8128.

SUPPLEMENTARY INFORMATION:

BACKGROUND

Permitting the flight of aircraft which may not currently meet with all applicable airworthiness requirements for the purpose of accomplishing necessary maintenance or alterations is a practice of long standing, and FAA experience with this practice does not indicate that safety has been compromised. These flights are frequently advantageous amd may be safely conducted under carefully selected operating conditions and appropriate restrictions.

The authorization for flight of such aircraft is procedurally granted in the form of a special flight permit which is an airworthiness certificate issued by FAA airworthiness inspectors, upon application of the registered owner or its agent. The permit imposes conditions to insure the safety of the proposed flight and to require a certified inspection of the aircraft by an appropriately certificated maintenance entity to confirm that the aircraft is safe for that flight.

Section 21.197 of the Federal Aviation Regulations (FAR), recodified from § 1.76 of the Civil Air Regulations (CAR), basically provides that upon application by the registered owner or agent, a special flight permit may be issued for an aircraft that may not meet applicable airworthiness requirements, but is capable of safe flight for specified purposes. Section 21.199, recodified from CAR § 1.77, prescribes the method for issuance of special flight permits by the FAA airworthiness inspectors assigned to the FAA field office responsible for activities in the area where the intended flight is to originate.

Under that portion of the rule which has been in effect for over 25 years, a separate permit is required for each flight. The permit imposes conditions and limitations to insure an adequate level of safety for the proposed operation, including certification by an appropriately certificated person that the aircraft has been inspected and found safe for the intended flight.

On October 25, 1967, the FAA proposed to relax the separate permit requirement by extending the authority to allow a special flight permit to be issued with continuing authorization. That proposal made all Part 121 and Part 127 operators eligible to request a special flight permit that could be used repeatedly. The proposal became effective September 21, 1968, as § 21.197(c) in Amendment 21-22. That rule change was initiated by several requests from air carrier certificate holders for authority to issue their own ferry permits, under certain specifically controlled circumstances. The petitioners indicated that a special flight permit with a continuing authorization for such holders would be economically and administratively beneficial without derogating safety. Experience indicated that certain problems which necessitated the ferrying of aircraft reoccurred sufficiently often to justify granting to the operator a special flight permit with continuing authority to enable the ferrying of aircraft in those recurring situations. The Part 121 and Part 127 certificate holders, by virtue of FAA supervised continuous airworthiness maintenance programs, are in a position to establish procedures, for necessary flights to a maintenance base, that will assure an adequate level of safety. Requiring a separate application for each ferry flight, as was previously necessary, placed a burden upon both the certificate holder and the FAA, where each request was required to be handled individually with the FAA assigned maintenance inspector.

There is a distinct relationship between continuous airworthiness maintenance programs and special flight permits with continuing authorizations. Specifically, both are dependent on formal management controls by the certificate holder in conjunction with the assignment of primary responsibility for airworthiness of aircraft subject to those programs. In addition, these certificate holders have internal communications systems which lend themselves to expeditious and accurate processing of the permit and related information. The FAA issues a permit with continuing authorization to each certificate holder in the form of operations specifications which impose conditions and limitations commensurate with the characteristics of their operations and their administrative capabilities.

The next development in amending special flight permit requirements for air carriers occurred on April 5, 1976, when the FAA proposed extending the authority of § 21.197(c) to allow operators of large aircraft under § 135.2 to apply for special flight permits with continuing authorization. The rationale for this action was that aircraft operated under § 135.2 had to be maintained under a continuing airworthiness maintenance program in accordance with Part 121 and, therefore, were subject to the same high level of control. That proposal was adopted in Amendment 21-45, effective October 28, 1977.

In December 1978, Part 135 was substantially revised to require that aircraft with 30 passenger seats or less, or a maximum payload capacity of 7,500 pounds be operated and maintained under Part 135. Further, it requires that aircraft operated under Part 135 with 10 or more passengers be maintained in accordance with continuous airworthiness maintenance programs and that aircraft with nine or less passengers could be so maintained upon election of the operator. In effect, the now current maintenance requirements for these aircraft satisfy the established eligibility criteria that have been applied to other air carriers for special flight permits with continuing authorization.

THE PROPOSAL AND DISCUSSION OF COMMENTS

The FAA has processed a number of petitions for exemption from Part 135 operators to allow issuance to them of special flight permits with continuing authorization. In granting the exemptions as being in the public interest, the FAA agreed with the operators that aircraft maintained under continuous airworthiness maintenance programs could be given such permits with no adverse effect on safety. It was also shown that under the regulation requiring individual flight permits, the operators were subject to economic penalties due to excessive aircraft downtime for maintenance items resulting from the requirement to get individual ferry approvals from FAA offices that in many cases were distantly located or closed during non-working hours. In many situations where operators believed they could not get timely FAA ferry approval, they perceived their only alternative was the relatively expensive one of transporting maintenance personnel to the remotely located aircraft that required service. Finally, even in cases where individual permits could be readily obtained, the procedure imposed an administrative burden on both the operator and the FAA.

Based on the number of petitions for exemption, the considerations that led to grants of exemption, and the overall regulatory policy of granting the same relief to all certificate holders that had been given by exemption to a few, the FAA proposed in Notice 80-23 (45 FR 80450; December 4, 1980) that the eligibility for a special flight permit with continuing authorization be extended to all Part 135 operators. Accordingly, the notice proposed to amend § 21.197(c) by deleting the special provision for large aircraft operating under § 135.2 and substituting instead an eligibility provision covering all Part 135 aircraft operated and maintained under a prescribed continuous airworthiness maintenance program.

The proposed amendment to § 21.197 is one of 32 proposed changes contained in Notice 80-23. The other proposals of Notice 80-23 do not relate to special flight permits and will be dealt with in other rulemaking actions.

Three comments were received on the proposal. All of the commenters concurred in the proposal; however, one commenter recommended further extending the eligibility to manufacturers to allow them to ferry uncertificated (i.e., "green") aircraft from one manufacturing facility to another. This suggestion is beyond the scope of the notice since the proposal was clearly limited to Part 135 operators flying aircraft to a base where maintenance or alterations are to be performed. Moreover, the commenter did not explain why manufacturers need such a permit or why current procedures are inadequate.

DISCUSSION OF THE AMENDMENT

The revision of § 21.197 adopted by this amendment is the same as the one proposed in Notice 80-23. Under the amendment, the specific guidelines, conditions, and limitations for administering the authorization for certificate holders under Part 135 will be identical to those for certificate holders under Parts 121 and 127. Procedurally, the special flight permit with a continuing authorization will be issued as an amendment to the certificate holder's operations specifications using the certificate holder's manual for amplification. The special flight permit with continuing authorization will eliminate the considerable economic and administrative burden on the certificate holders under Part 135, and the affected FAA elements associated with individual special flight permits needed for ferrying aircraft to bases where maintenance can be performed. Through approval of the certificate holder's continuous airworthiness maintenance programs, by setting conditions and limitations in operations specifications, and by prescribing detailed instructions in the certificate holder's manual, the FAA's issuance of special flight permits with continuing authorization afford an equivalent level of safety to that established when the FAA issues individual special flight permits. It should be noted that no flight conducted under a special flight permit with a continuing authorization will involve carriage of passengers.

Based upon its experience with Parts 121 and 127 operators, the FAA concludes that allowing air taxi operators the same rights to be eligible for continuing authorization of special flight permits is in the public interest. It will allow a segment of the aviation industry that maintains its aircraft under a continuous airworthiness maintenance program the same rights as other segments. The rule does not grant blanket authority solely because the operator [illegible] a continuous airworthiness maintenance program, but gives eligibility to all those operators. Special flight permits with continuing authorization will be granted on an individual operator basis, similar to those granted to Part 121 and Part 127 operators.

ADOPTION OF THE AMENDMENT

Accordingly, Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended effective July 23, 1981.

(Secs. 313(a), 314, and 601 Federal Aviation Act of 1958, as amended, (49 U.S.C. 1354(a), 1355, and 1421); Sec. 6(c), Department of Transportation Act (49 U.S.C. 1655(c); 14 CFR 11.49).)

NOTE: Since this amendment is relaxatory in nature and affects relatively few aircraft operators, it has been determined that this document (1) involves a regulation which is not a major rule under Executive Order 12291; (2) is not a significant rule pursuant to the Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979); and (3) under the criteria of the Regulatory Flexibility Act, promulgates a rule that will not have a significant economic impact on a substantial number of small entities.

A copy of the final regulatory evaluation for this action is contained in the public docket. A copy of that evaluation may be obtained by contacting the person identified above under the caption "FOR FURTHER INFORMATION CONTACT."

Amendment 21-55

Export Airworthiness Approvals

Adopted: August 19, 1981 **Effective: October 8, 1981**

(Published in 46 FR 44735, September 8, 1981)

SUMMARY: This amendment provides for the issuance of special export certificates of airworthiness for restricted category aircraft. As amended, the rule now permits an exporter to obtain such a certificate for a restricted category aircraft under the same procedures and with the same privileges applicable to aircraft having standard airworthiness certificates. By relieving regulatory requirements applicable to exporters of restricted category aircraft, this amendment facilitates foreign sale demonstration tours and gives potential for increased export sales. Under the new rule, upon the sale of an aircraft in a foreign country, exporters will be relieved of any costs associated with having to return the aircraft to the United States or applying to an overseas FAA office to obtain an export certificate of airworthiness or, alternatively, having to seek relief via the exemption process. This amendment is in response to the petition of a manufacturer who cites the burden imposed upon it and persons similarly situated under the preexisting rule. By easing the burden imposed on exporters of U.S.-manufactured restricted category aircraft, the revised rule is in full accord with Executive Order 12291.

FOR FURTHER INFORMATION CONTACT:

Mr. Joseph A. Sirkis, Regulatory Projects and Branch (AVS-24), Safety Regulations Staff, Associate Administrator for Aviation Standards. Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591; telephone (202) 755-9716.

Notice

This amendment is based upon a Notice of Proposed Rule Making (Notice No. 80-20) published in the *Federal Register* on November 20, 1980 (45 FR 76868). All interested persons were afforded the opportunity to participate in the making of this regulation.

Background

Current export airworthiness procedures were first proposed in Federal Aviation Agency Notice No. 63-15 published on April 17, 1963 (28 FR 3728), as an amendment to Part 1 of the Civil Air Regulations (CAR). By the time the final rule was issued, however, Part 1 of the CAR had been recodified as Part 21 of the Federal Aviation Regulations (FAR), and the new amendment was issued as Subpart L of Part 21 (30 FR 8464; July 2, 1965).

Subpart L of Part 21 established eligibility criteria for the issuance of export certificates of airworthiness for aircraft in two situations: first, when an aircraft is to be exported to a particular foreign country; second, when an aircraft is to be flown to several foreign countries for the purposes of demonstration and eventual sale. In the first case, the exporter is eligible for an export certificate of airworthiness under § 21.329 prior to the aircraft's departure from the United States. This export certificate of airworthiness, which is available for both standard and restricted category aircraft, certifies to a particular importing country that the aircraft conforms to its U.S. type certificate, that it complies with any special requirement notified by the importing country, and that it is in a condition for safe operation. However, this certificate is only valid in the country to which the aircraft is being exported.

In the second situation, under § 21.339, the exporter of an aircraft that has a standard airworthiness certificate may obtain, prior to departure from the United States, a special export certificate of airworthiness covering sales demonstrations in any number of countries in which a prospective purchaser is sought. Upon finding a buyer, the exporter has, in hand, a valid export certificate of airworthiness to facilitate airworthiness acceptance by the country in which the aircraft is to be sold. This relieves the exporter of the need to return the aircraft to the United States or applying to an overseas FAA office for a certificate under § 21.329. Section 21.339, which was adopted in 1965, inadvertently did not make this procedure available for restricted category aircraft sales. A restricted category aircraft is one intended for certain "special-purpose operations," such as agricultural users, and which is type certificated in accordance with § 21.25 or CAR Part 8, i.e., meets the airworthiness requirements of an aircraft category except for those the Administrator finds inappropriate for the special purpose involved. Prior to 1965, export approvals were governed by the administrative procedures contained in FAA Manual of Procedures (MOP) 2-4. MOP 2-4, Part 1, paragraph 13, permitted issuance of "blanket" (equivalent to the current "special") export certificates of airworthiness for restricted category aircraft. Since there evidently was no intent to change the previous export airworthiness procedures on codification of the MOP into § 21.339 in 1965, this amendment reinstates preexisting procedures by revising § 21.339 to include eligibility of restricted category aircraft for special export certificates of airworthiness.

The FAR do not require an aircraft to have an export certificate of airworthiness to be exported. However, such a certificate greatly facilitates airworthiness acceptance of U.S. aircraft by importing countries, thus increasing the foreign sales potential of these aircraft. In accordance with the bilateral agreements between the United States and other countries, the certificate will be given the same validity by the importing country as a certificate issued by its own aviation authority. However, since the importing country has the prerogative to define the airworthiness requirements that must be met for import, this amendment does not guarantee import acceptance. Exporters should consult with the airworthiness authority in the importing country to determine the eligibility of restricted category aircraft and to determine what, if any, special/additional requirements must be met before assuming import acceptance.

Discussion of Comments

The FAA received two comments in response to Notice 80-20. These comments express the views of two associations, one representing the manufacturing industry, the other representing airline pilots. The former commenter supports the proposal as published. The latter commenter has no specific comments to offer. Neither comment received in response to Notice 80-20 was unfavorable.

Discussion of Amendment

This rulemaking action was initiated by a petition for rulemaking filed by the Grumman American Aviation Corporation of Elmira, New York. The petition requested that § 21.339(a) be amended to permit issuance of special export airworthiness certificates for restricted category aircraft it manufactures and for products of other exporters similarly situated. The petitioner specifically cites the situation in connection with its Grumman Model G-164 series agricultural aircraft (Ag-Cat). In support of its request, the petitioner makes three basic arguments.

First, the petitioner contends that aircraft such as the Ag-Cat are needed throughout the world for the production and protection of food supplies. In connection with this point, the petitioner notes that extending the special certificate procedure would greatly facilitate exporting such aircraft and thereby help the U.S. balance of trade and that such an action would be in the U.S. public interest.

Second, the petitioner contends that excluding restricted category aircraft from the special certificate procedure places an unfair economic burden on the manufacturers.

Finally, the petitioner contends that permitting the procedure for restricted category aircraft would not compromise safety since the aircraft are already eligible for an export certificate of airworthiness under § 21.329(a).

With respect to the petitioner's first and second contentions, it is clear that procedures existing prior to this amendment caused an additional financial expense and delay when exporting a restricted category aircraft when compared to the procedures for exporting a standard category aircraft that is flown to several foreign countries for the purpose of sale. For example, additional expense and delays were incurred when a newly manufactured restricted category aircraft that was exported for demonstration to a particular country under § 21.329 was sold to a person in another foreign country for which the aircraft did not have an export certificate of airworthiness. In the petitioner's case, the exporter incurred an expense of $5,000 because of storage and air transportation charges incidental to inspection by an FAA inspection representative from an overseas field office. This would not have been the case with aircraft having standard airworthiness certificates which were and currently remain eligible for a special export airworthiness approval under § 21.339. Thus, the previous rule resulted in an inequitable situation for the exporter of a restricted category aircraft who would, for each sale in a foreign country, be subjected to delays and additional expense or alternatively be required to seek relief via the exemption process.

The FAA agrees with the petitioner's third contention that this amendment will not result in a reduction in safety. Under this amendment, any restricted category aircraft covered by the new procedure must meet the FAA requirements for a U.S. restricted category airworthiness certificate under § 21.185. The aircraft must also, under § 21.339(e), meet the importing country's special airworthiness requirements. Because these two requirements also appear in § 21.329 for export certificates, the aircraft will be held to the same high standards of airworthiness that have always been required for export of restricted category aircraft.

The FAA has analyzed the possible impact of this amendment on the 23 bilateral airworthiness agreements (executive agreements) in effect between the United States and certain other countries concerning certificates of airworthiness for import aircraft. This amendment does not contravene any of those agreements, and it does not interfere with the right of the importing country to make acceptance of the special export certificate dependent upon the product's meeting any special/additional requirements which the importing country finds necessary to ensure that the aircraft meets a level of safety equivalent to that provided by its applicable laws, regulations, and requirements which would be effective for a similar aircraft produced in the importing country. There are a number of countries which place limitations on the import of restricted category aircraft; such limitations appear in those countries' "special requirements" (as published in FAA Advisory Circular 21-2) and under § 21.339 must be met by any exporter. This amendment, therefore, does not interfere with any country's internal rules. Nevertheless, in accordance with international agreements and § 21.335(d), an operator of a U.S.-registered restricted category aircraft having a special export airworthiness approval must obtain permission from each country prior to flight in that country. Such permission need not be obtained as a condition of issuance of the special export airworthiness certificate but must be obtained prior to flight in any foreign country.

This amendment will eliminate the potential financial burden and delays associated with having to return the aircraft to the United States or applying to an FAA overseas field office to obtain an export certificate of airworthiness or, alternatively, having to seek relief via the exemption process. For these reasons, the amendment fully complies with and achieves the purposes of Executive Order 12291.

Regulatory Evaluation

The FAA conducted a regulatory evaluation which is included in the regulatory docket for this action. It is summarized below.

Costs

The FAA's analysis determines that there will be no cost impact on manufacturers and exporters of restricted category aircraft and only a minimal to negligible cost impact to the Government. The Government will incur minor cost in the revision of § 21.339, which is considered already to be a part of FAA's ongoing program to simplify and ease the burden of the regulations.

Benefits

Implementation of this final rule is expected to provide benefits to FAA and to manufacturers and exporters of restricted category aircraft. Exporters of restricted category aircraft choosing to conduct foreign sale demonstration tours for the purpose of consummating a sale during the tour will benefit by being relieved of the burden of returning the aircraft to the United States or to an overseas FAA office to obtain a special export certificate of airworthiness valid in the country in which the aircraft has been sold. In addition, exporters may be encouraged to increase multination sales tours, with corresponding benefit from sales increases resulting from this additional approach to the marketing of their aircraft abroad. The FAA will benefit from the reduction in administrative costs associated with issuing special export certificates of airworthiness for restricted category aircraft to be sold potentially in more than one country.

Adoption of the Amendment

Accordingly, § 21.339(a) of the Federal Aviation Regulations (14 CFR § 21.339(a) is revised, effective October 8, 1981.

(Secs. 313(a), 601, and 603, Federal Aviation Act of 1958, as amended (49 U.S.C. 1354(a), 1421, and 1423; Sec. 6(c), Department of Transportation Act (49 U.S.C. 1655(c)); and 14 CFR 11.49)

NOTE: The Federal Aviation Administration has determined that this document involves a regulation which is not a major rule under Executive Order 12291 or a significant regulation under the DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). A copy of the final evaluation prepared for this action is contained in the regulatory docket. A copy of it may be obtained by contacting the person identified under the caption "FOR FURTHER INFORMATION CONTACT." It has been determined also that the amendment will not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act since it is relieving in nature.

Amendment 21-56

Aircraft Noise Requirements; Amendment to Definition of "Acoustical Change" to Permit Temporary, Limited Engine/Nacelle Intermix for Turbojet Engine Powered, Transport Category Large Airplanes

Adopted: December 12, 1981 **Effective: February 8, 1982**

(Published in 47 FR 756, January 7, 1982)

SUMMARY: This action amends the definition of "acoustical change" in the aircraft noise certification rules as applied to turbojet engine powered, transport category large airplanes. The amendment permits the temporary installation and use (intermix) of different engines or nacelles changes or both, on a particular airplane for a 90 day period without further documentation of the noise levels, provided that the airplane is brought back into conformance with an acoustically certificated configuration for that airplane within 90 days of the initial change.

Under the previous rule, any voluntary change in type design of an airplane that might increase noise was an "acoustical change" and after the design change the airplane could not exceed specified noise levels. Thus, it was frequently necessary for aircraft manufacturers or operators to show that each possible engine/nacelle configuration combination complied with applicable noise levels, even if that configuration was only installed temporarily. They were also required to provide complete airplane flight manual materials approved by the FAA for each affected airplane. Those processes imposed a considerable manpower and paperwork obligation on the part of the manufacturer, the operator, and the FAA. The FAA's review showed that potential increase in aircraft noise would be minimal and, thus, that the requirement was unduly restrictive. Accordingly, this amendment allows type design changes, that are limited to the engine, or nacelle, or both, where the airplane may be operated without such compliance for a period of not more than 90 days.

FOR FURTHER INFORMATION CONTACT:

Mr. Richard N. Tedrick, Noise Policy and Regulatory Branch (AEE-110), Noise Abatement Division, Office of Environment and Energy, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591; telephone (202) 755-9027.

SUPPLEMENTARY INFORMATION:

I. REGULATORY HISTORY

In accordance with FAR Part 11.25(c), the Air Transport Association of America (ATA) petitioned the FAA on January 4, 1980, for an exemption from FAR Part 21.93(b) and for an appropriate rule change to allow unlimited intermix on its members' operating fleets for a period of up to 90 days. A summary of that petition was published in the FEDERAL REGISTER for public information and comment on March 6, 1980 (45 FR 14590).

On January 26, 1981, the Federal Aviation Administration (FAA) published a Notice of Proposed Rulemaking, Notice No. 81-3 (46 FR 8347), proposing to amend the definition of "acoustical change" in the aircraft noise certification rules as applied to turbojet engine powered, transport category large airplanes. The Notice proposed permitting the temporary installation and use (intermix) of different engines or nacelles on a particular airplane for a 90 day period without further documentation of the noise levels, provided that the airplane is brought back into conformance with an acoustically certificated configuration for that airplane within 90 days of the initial change. Interested persons were invited to comment on the proposals contained in that Notice by March 27, 1981. All comments received were given full consideration in the promulgation of this amendment. Except as discussed below, this amendment adopts the proposals in Notice No. 81-3 without substantive change.

Pursuant to § 611(b) (1) of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1431) the FAA has consulted with the Secretary of Transportation and the U.S. Environmental Protection Agency (EPA) prior to the adoption of this amendment. An environmental assessment regarding this amendment has been prepared in accordance with applicable environmental review procedures. This amendment was submitted to the EPA in accordance with § 309 of the Clean Air Act, as amended (42 U.S.C. 1857h-7).

Part 36 of the Federal Aviation Regulations "Noise Standards: Aircraft Type Certification" (34 FR 18355; November 18, 1969), which became effective December 1, 1969, originally prescribed noise measurement, evaluation, and level requirements for the issuance of type certificates, and changes to those certificates, for subsonic transport category large airplanes and for subsonic turbojet engine powered airplanes regardless of category and weight. That regulation initiated the regulatory noise abatement program of the FAA under the statutory authority of Public Law 90-411 (July 21, 1968), which added § 611 to the Federal Aviation Act of 1958 (the "FA Act").

II. SYNOPSIS OF THE AMENDMENT

The purpose of this amendment is to change § 21.93(b) of the FARs (14 CFR Part 21) to amend the definition of "acoustical change" as applied to turbojet engine powered, transport category large airplanes. The amendment is based upon a recommended change to the rule submitted in a petition for rulemaking under FAR Part 11 by ATA dated January 4, 1980. A summary of that petition was published in the FEDERAL REGISTER for public information and comment on March 6, 1980 (45 FR 14590). Section 21.93(b) previously defined "acoustical change" as any voluntary change in the type design of an airplane that might increase the noise levels of the airplane.

The petition requested an amendment to § 21.93(b) so that temporary (less than 90 day) engine/nacelle intermixes for maintenance purposes on turbojet engine powered, transport category large airplanes would not be classified as "acoustical changes" and, thus, not be governed by the applicable requirements of § 36.7 of Part 36. Petitioner's reasons for the amendment indicate that granting of the petition would have a minimum effect on individual airplane noise and an even lesser effect on national fleet noise level. Results would include significant cost savings, reduced spares inventory, better allocation of manpower resources, and reduced workload and paperwork burden on industry and government.

III. AIRCRAFT NOISE RULES

Public Laws 90-411, 92-574, 95-609, and 96-193 were enacted to provide the statutory basis for promulgating regulations providing present and future relief and protection to the public health and welfare from noise and sonic boom from civil aircraft. Under § 611 of the FA Act, the FAA, after consultation with the Secretary of Transportation and the Administrator of the Environmental Protection Agency, is responsible for the adoption and amendment of rules which prescribe the necessary standards and regulations.

Since the adoption of FAR Part 36 in 1969, the FAA has issued a number of proposed amendments to its provisions and, subsequent to notice and public procedure, adopted those amendments which have been found to be consistent with the provisions of § 611 of the FA Act. Those amendments have increased the protection of the public health and welfare regarding noise and sonic boom. In addition to the FAR Part 36 airplane noise certification rules, the FAA has adopted rules governing how airplanes should be operated for noise control purposes. On March 28, 1973, the FAA published an amendment to Part

91 (Amendment 91-112; 38 FR 8051) to prohibit unauthorized operation of civil aircraft at supersonic speeds over the United States. Amendment 91-134 (41 FR 52388; November 29, 1976), amended Part 91 for noise abatement purposes to require that a pilot in command of a civil turbojet-powered airplane use the lowest authorized flap setting consistent with safety. Amendment 91-136 (41 FR 56046; December 23, 1976) added Subpart E to Part 91 to require phased compliance with the Part 36 noise limits by U.S. registered, civil subsonic turbojet engine powered airplanes with maximum weight of more than 75,000 pounds having standard airworthiness certificates and engaged in air commerce in the United States.

IV. NEED FOR REGULATION

The need for this amendment stems from difficulties in complying with the current acoustical change provisions of FAR § 21.93(b) when, for operational purposes, the airline operators must "intermix" engine configurations. The current rules require that each such configuration must be fully certificated for both safety (airworthiness) and noise, even though many configurations would only be employed for short periods. The FAA has determined that while the safety requirements are appropriate and necessary, the amount of paperwork burden on both industry and government for certificating temporary configurations for noise is unwarranted. Docket comments have also pointed out that the current rule is costly to the operators because it prohibits the use of certain spares that are otherwise approved from the airworthiness standpoint.

Industry data and FAA-sponsored research indicated that the increase in aircraft noise would be minimal and not have a significant impact. The FAA conducted an environmental assessment which resulted in a Finding of No Significant Impact. A copy of that finding is available in the public docket.

V. COMMENTS AND RESPONSES

The FAA received 12 comments from interested persons including local governmental bodies, the aviation industry, aircraft owners, and airplane operators in response to Notice No. 81-3. Most commenters supported the proposal; however, several issues were raised. For example, suggestions were made concerning a specific language change and extending the time limit. Thus, the comments and FAA's response to them are discussed as follows:

Specific Language Change

Eight comments were received which expressed concern that the language in the notice did not correctly reflect the intent of the ATA's petition. Specifically, commenters questioned the design changes being limited to an "engine or nacelle change." The commenters recommended using the language suggested by the ATA in its original petition which was "engine and/or nacelle changes."

The FAA has given full consideration to the "and/or" provision. After reviewing the commenters' recommendations, the FAA has further clarified its intent by changing the wording from "or" to "engine or nacelle changes or both." In doing so, the definition of "acoustical change" provides increased flexibility in the use of airworthiness approved 90-day engine/nacelle intermixes.

Time Limits

Three comments were received on this feature of the proposal, with one supporting the 90 day time limitation.

Another commenter expressed his opinion that the ATA's petition included the time limit as a concession to environmental pressures. The commenter also mentioned that perhaps there was a need for a relaxed limit of 180 or 360 days, and that the environmental degradation would not be noticeable even with widespread exercise of this relaxed provision.

The third commenter proposed an additional relief by extending the maximum period for which an airplane may be out of conformance from 90 to 180 days. That commenter contends that the noise impact will be very slight and most probably not be discernible to the human ear. Also, the need for temporary intermix operation does not happen very often during the life of an airplane. It usually is related to either the introductory phase of new airplanes into an existing fleet and possibly to engine upgrade programs. So according to the commenter, even a 180 day period will in fact only represent a very minor portion of the total life of an airplane.

The FAA believes that the 90 days proposed for temporary engine/nacelle intermixes is a sufficient time period. The FAA agrees with the petitioner that the paperwork and documentation requirements for the temporary design changes covered by the proposal are grossly disproportionate to the noise benefits they preserve for a short period such as 90 days or less. However, the proposed exception must be carefully prescribed to limit its impact on aircraft noise emissions to those clearly shown to be unwarranted in fulfilling the rule's purposes. Thus, the proposed exception would apply only if an engine/nacelle change accomplished on an individual airplane is temporary—that is, the airplane is brought back into conformance with an acoustically certificated configuration for that airplane within 90 days after the initial change. Implementation is controlled through the Airplane Flight Manual and installation documentation approvals.

Present Regulation Should Remain Unchanged

One comment was received that stated that the present regulation should remain unchanged. The commenter is concerned in particular with the increase in noise levels at John F. Kennedy Airport in New York. The commenter addressed the fact that the FAA, using several airlines' data on their B-727 aircraft, estimated that the cumulative Day-Night Noise Level (Ldn) for those airplanes would usually rise an average less than 0.1 decibels at a medium size hub airport. The actual Ldn level could be higher or lower depending on the number of airplanes using intermixes at the airport during any given period. Since JFK is a large size hub airport, the commenter concludes that it can reasonably be assumed that the noise level there will rise considerably more than estimated. That commenter also stated that the more important noise measurement is the single event measure, not cumulative impact analysis.

The FAA appreciates the views expressed in this comment. The purpose of analyzing noise is to evaluate its effect on humans. To do this, numerous specialized measurement techniques and noise units have been developed over the years. For aviation noise analyses, the FAA has determined that the cumulative noise measures be used for all noise analyses. The single event measure, A-weighted sound level dB(A) in decibels is appropriate only as a supplement to cumulative impact analysis. In addition, studies have shown that the increase in aircraft noise from this action will be minimal; in some cases the noise resulting from intermix will be reduced. The overall effect will be no measurable increase in cumulative aircraft noise.

The FAA is aware that the estimated number for increased noise levels depends on the number of airplanes operating under this amendment. However, the need for temporary intermix operation does not occur very often during the life of an airplane. Thus, the definition of "acoustical changes" is being amended to apply to configurations that will be used for maintenance purposes.

Noise Suppression Equipment

One comment was received that suggested expanding design changes to include changes to noise suppression equipment, not covered by the intermix of engines and nacelles.

In order to properly respond to this comment the FAA would need a further explanation of the commenter's intent. So far, the FAA has not received any data on this subject. In addition, this issue was not presented in the NPRM and this action is limited to the scope of that Notice.

VI. ANALYSIS OF THE AMENDMENT

This action amends section 21.93(b) of Part 21 of the FARs (14 CFR Part 21) which contains the definition of "acoustical change" in the aircraft noise certification rules as applied to turbojet engine powered, transport category large airplanes. The following discussion outlines the changes to section 21.93(b) of Part 21 of the Federal Aviation Regulations.

Section 21.93(b) is amended to allow the provision concerning acoustical changes to permit, under specified conditions, the intermixing of engines or nacelles changes or both, on an affected airplane. It does not affect any other applicable requirements for certification of type design or airworthiness, or for operating the affected aircraft—only those governing noise level certification. This section approves 90 day intermixes, and contemplates the reinstallation of a complying engine/nacelle combination at or before the end of the 90 days period.

Therefore, the objective of this revised paragraph is (1) to allow unlimited intermix of engines and/or nacelles for maintenance purposes up to a period of 90 days without triggering the acoustical change requirements, and (2) to thereby provide relief to operators, manufacturers, and the FAA without significant aircraft noise impact.

ADOPTION OF THE AMENDMENT

Accordingly, section 21.93 of Part 21 of the Federal Aviation Regulations (14 CFR 21) is amended, effective February 8, 1982.

(Secs. 313(a), 601(a), 603, and 611, Federal Aviation Act of 1958, as amended (49 U.S.C. §§ 1354(a), 1421(a), 1423 and 1431); Sec. 6(c), Department of Transportation Act (49 U.S.C. § 1655(c)); Title I, National Environmental Policy Act of 1969 (42 U.S.C. § 4321 et seq.), Executive Order 11514 March 5, 1970; and 14 CFR 11.45.)

NOTE: As cited above, the FAA has determined that this amendment will result in a reduction of costs to both the Government and the public. It, therefore, is not a "major rule" under Executive Order 12291 and is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). Further, it is certified that this amendment will not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act as relatively few small entities will be affected and the effect on them should be minimal. A copy of the regulatory evaluation prepared for this action is contained in the regulatory docket. A copy of it may be obtained by contacting the person identified under the caption "FOR FURTHER INFORMATION CONTACT."

Amendment 21-57

Market Survey Experimental Certificates for Aircraft Modifiers

Adopted: September 10, 1984 **Effective: November 8, 1984**

(Published in 49 FR 39650, October 9, 1984)

SUMMARY: This amendment permits aircraft modifiers who are neither aircraft nor aircraft engine manufacturers to apply for an experimental certificate to use the modified aircraft for market surveys, sales demonstrations, or customer crew training in the same manner as aircraft and aircraft engine manufacturers. In recent years type-certificated aircraft have been altered by a variety of modifications other than installation of different engines. Aircraft and aircraft engine manufacturers are eligible for experimental certificates to conduct market survey flights of their modifications. This amendment permits other aircraft modifiers to conduct such flights using an experimental certificate without obtaining an exemption for this purpose.

FOR FURTHER INFORMATION CONTACT:

Alphonse G. Santarelli, Aircraft Manufacturing Division (AWS-200), Office of Airworthiness, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591; telephone (202) 426-8361.

SUPPLEMENTARY INFORMATION:

Background

This amendment, which permits aircraft modifiers who are neither aircraft nor aircraft engine manufacturers to apply for an experimental certificate to use the modified aircraft for market surveys, sales demonstrations, or customer crew training in the same manner as aircraft and aircraft engine manufacturers, is adopted for essentially the reasons outlined in Notice of Proposed Rulemaking (NPRM) No. 84-1 (49 FR 6468; February 21, 1984). That action responded to the Raisbeck-Western petition to amend § 21.195(a) to permit aircraft modifiers to use those aircraft for market survey purposes in the same manner as aircraft manufacturers.

Section 21.195(a) of the Federal Aviation Regulations (FAR) states that a manufacturer of aircraft manufactured within the United States may apply for an experimental certificate for an aircraft that is to be used for market surveys, sales demonstrations, or customer crew training. Section 21.195(b) of the FAR states that a manufacturer of aircraft engines who has altered a type-certificated aircraft by installing different engines, manufactured by him within the United States, may apply for an experimental certificate for that aircraft to be used for market surveys, sales demonstrations, or customer crew training if the basic aircraft, before alteration, was type certificated in the normal, acrobatic, or transport category. For the purpose of this amendment, an aircraft modifier is a person who has altered the design of an aircraft that before alteration was type certificated in the normal, acrobatic, or transport category.

In recent years, type-certificated aircraft have been altered by a variety of modifications other than installation of different engines. The above sections do not permit a "non-engine" aircraft modifier to apply for an experimental certificate to use an aircraft altered by him for market surveys, sales demonstrations, or customer crew training. A number of aircraft modifiers have been granted exemptions from either § 21.195(a) or (b) to the extent necessary to permit those aircraft modifiers to apply for experimental certificates for aircraft to be used for market surveys, sales demonstrations, or customer crew training, subject to certain limitations.

In view of the foregoing, the Federal Aviation Administration (FAA) has determined that it is in the public interest to permit aircraft modifiers to apply for an experimental certificate to use the modified aircraft for market survey purposes.

This amendment also adds a cross-reference provision to § 21.191(f) to more clearly show the interrelationship between this paragraph and § 21.195. Also, the utility category is added to § 21.195(c) since the utility category is one of the standard categories listed in §§ 21.21 and 21.183 and was inadvertently omitted previously. These are considered to be editorial changes.

DISCUSSION OF COMMENTS

Seven commenters, representing the views of associations, individuals, and modifiers, submitted responses to NPRM 84-1. The responses are favorable.

Five commenters concur with the NPRM. One commenter, a pilot association, has no comment on the NPRM at this time. Another commenter, an airline association, advises that 14 members replied: 6 members concur with the NPRM, 6 members have no objection, and 2 members have no comment.

REGULATORY EVALUATION

Benefits

Adopting this rule will relieve an unnecessary regulatory constraint and would thus provide benefits to certain aircraft modifiers. It will allow them to be eligible to apply for experimental certificates under Part 21 to test the market potential of modified aircraft before mass producing the modification kits, to demonstrate the modified aircraft to potential customers, and to conduct customer crew training.

In addition, a number of aircraft modifiers have been granted exemptions in the past to allow them to apply for experimental certificates for market survey. This rule will eliminate the need for an aircraft modifier to obtain an exemption from the requirements of Part 21 to apply for an experimental certificate to allow the modifier's aircraft to be used for market surveys, sales demonstrations, or customer crew training in the same manner as an aircraft or aircraft engine manufacturer. By obviating the need for an exemption, this rule will eliminate the minor cost required to develop and submit a petition for exemption and avoid the minor costs related to time lost while the aircraft modifier awaits the exemption. Additionally, the Federal Government (FAA) will experience minimal cost savings as the requirement to review and process petitions for exemptions submitted by aircraft modifiers to apply for experimental certificates is eliminated.

Costs

This rule will impose no new costs or requirements on aircraft modifiers, the aviation public, or the Federal Government. This rule will permit aircraft modifiers to submit applications for experimental certificates for market surveys which the FAA will process consistent with practices under § 21.195(a) and (b).

Comments Received on Notice of Proposed Rulemaking

Seven commenters, representing the views of associations, individuals and modifiers, submitted responses to the NPRM. Four commenters provided statements with regard to the economic considerations, with all endorsing the proposed rule as having a positive economic impact.

Benefit/Cost Conclusion

Based on the aforementioned discussion of the benefit and cost aspects of the rule, the benefits clearly exceed the costs.

International Trade Impact Analysis

This rule will have little or no impact on trade for both U.S. firms doing business in foreign countries and foreign firms doing business in the United States. Furthermore, no comments were received on the topic of international trade impacts.

Regulatory Flexibility Act Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure, among other things, that small entities are not disproportionately affected by Government regulations. The RFA requires agencies to review rules which may have a "significant economic impact on a substantial number of small entities." Certain aircraft modifiers may be classified as small entities according to the RFA. However, since this proposed rule would result in minimal savings and would not impose additional cost, it will not have a significant economic impact on any of these entities.

Therefore, FAA has determined that the amendment will not, if enacted, have a significant economic impact on a substantial number of small entities.

CONCLUSION

This amendment provides compatibility with other paragraphs in § 21.195 to enable a modifier of aircraft to obtain an experimental certificate for a modified aircraft in the same manner as an aircraft or engine manufacturer. Furthermore, this amendment is not likely to result in an annual effect on the economy of $100 million or more or a major increase in costs for consumers; industry; or Federal, State, or local government agencies. In addition, this amendment will have little or no impact on trade opportunities for U.S. firms doing business overseas or for foreign firms doing business in the United States. Accordingly, it has been determined that this is not a major regulation under Executive Order 12291. In addition, the FAA has determined that this action is nonsignificant under Department of Transportation Regulatory Policy and Procedures (44 FR 11034; February 26, 1979). Finally, as discussed previously in the preamble, it is certified under the criteria of the Regulatory Flexibility Act that this rule will not have a significant economic impact on a substantial number of small entities. A copy of the regulatory evaluation for this action is contained in the regulatory docket. A copy of it may be obtained by contacting the person identified under the caption "FOR FURTHER INFORMATION CONTACT."

ADOPTION OF THE AMENDMENT

Accordingly, Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended effective November 8, 1984.

(Sections 313, 314, 601, 603(c), 605, 608, 609, and 610, Federal Aviation Act of 1958, as amended (49 U.S.C. 1354, 1355, 1421, 1423(c), 1425, 1428, 1429, and 1430); 49 U.S.C. 106(g) (Revised Public Law 97-449, January 21, 1983).

Amendment 21-58

Shoulder Harnesses in Normal, Utility, and Acrobatic Category Airplanes

Adopted: November 6, 1985 Effective: December 12, 1985

(Published in 50 FR 46872, November 13, 1985)

SUMMARY: The amendment to Part 23 of the Federal Aviation Regulations requires the installation of shoulder harnesses at all seats of normal, utility, and acrobatic category airplanes with a passenger seating configuration, excluding pilot seats, of nine or less, manufactured one year after the effective date of the amendment. The amendment to Part 91 of the Federal Aviation Regulations requires the pilot-in-command to brief passengers on how to fasten and unfasten their shoulder harnesses for both takeoff and landing in aircraft with installed shoulder harnesses. The amendment, also, requires each occupant to use a shoulder harness, if installed, for takeoff and landing. These amendments respond to the conclusions of an FAA Crashworthiness Study Report, to a petition for rulemaking from the General Aviation Manufacturers Association and to safety recommendations from the National Transportation Safety Board. These amendments will enhance the crashworthiness of small airplanes manufactured one year after the effective date of these amendments.

FOR FURTHER INFORMATION CONTACT: J. Robert Ball, Regulations and Policy Office (ACE-110), Aircraft Certification Division, Central Region, Federal Aviation Administration, 601 East 12th Street, Kansas City, Missouri 64106; telephone (816) 374-5688.

SUPPLEMENTARY INFORMATION:

REGULATORY HISTORY

These amendments are based upon a Notice of Proposed Rulemaking, Notice No. 85-11, published in the *Federal Register* (50 FR 19108; May 6, 1985). All comments received in response to Notice No. 85-11 were considered in adopting these amendments.

BACKGROUND

Amendment 23-7 to Part 23 of the Federal Aviation Regulations (FAR), (34 FR 13078; August 13, 1969) upgraded many airworthiness standards for small airplanes. Section 23. 785 was amended to require that each occupant must be protected from head injury by a safety belt and one of the following: (1) A shoulder harness to prevent the head from contacting any injurious object; (2) elimination of any injurious object within the striking radius of the head; or (3) an energy absorbing rest that would support the arms, shoulders, head, and spine.

On January 31, 1973, the FAA issued Notice No. 73-1 (38 FR 2985) proposing to amend Parts 23 and 91 of the FAR to require: (1) Shoulder harnesses for all occupants of newly certificated small airplanes; (2) shoulder harnesses for all occupants of small airplanes manufactured one year after the effective date of the amendments, regardless of the type certification basis of the airplane; and (3) all small airplanes in service with structural shoulder harness attachment provisions, to be equipped with shoulder harnesses within one year after the effective date of the amendment.

The final action on Notice No. 73-1, was supported by the following information: (1) Approximately 80,000 to 90,000 of the 130,000 U.S. registered small airplanes in service would have been required to add shoulder harnesses on the basis of existence of structural provisions; (2) the cost per seat for the installation of a shoulder harness would have varied from $20 to $200 for most airplanes, and installations made at the factory would mainly have been in the $20 to $40 per seat range; and (3) two percent of the then current airplanes would be equipped with shoulder harnesses, 50 percent of those shoulder harnesses would be used on a regular basis, and the increased availability of shoulder harnesses would have contributed significantly to occupant protection in an airplane accident.

As the final action on Notice No. 73-1, the FAA issued Amendment 23-19 to Part 23 and Amendment 91-139 to Part 91 (42 FR 30601; June 16, 1977). Amendment 23-19 requires the installation of shoulder harnesses for the front seats of all small airplanes for which an application for a type certificate is received after July 18, 1978. Amendment 91-139 requires the installation of shoulder harnesses for the front seats of small airplanes manufactured after July 18, 1978.

Section 23.785(j) was added to require, in part, that the cabin area surrounding each seat within striking distance of the occupant's head or torso be free of potentially injurious objects and, furthermore, if energy absorbing designs are used to meet this requirement, they must protect the occupant from serious injury when the occupant experiences the ultimate inertia forces set forth in § 23.561(b)(2).

The National Transportation Safety Board (NTSB) considered the new rules to be inadequate since the new requirements applied only to the front seats of airplanes and recommended installation of shoulder harnesses at all seats. In response to these safety recommendations, the FAA informed the NTSB that if was considering the feasibility of requiring the installation of shoulder harnesses at all seat locations and that the economic impact of the various options was being carefully assessed.

In December 1981, the FAA completed a benefit-to-cost analysis for the installation of shoulder harnesses in all general aviation airplanes. The analysis included nine alternatives for rulemaking action related to the installation and use of shoulder harnesses. The alternatives considered are cited as follows:

1. Amend Part 23 to require shoulder harnesses at all seats on newly certificated airplanes (extension of the current rule which requires shoulder harnesses at the front seats only).

Although this alternative would not have affected existing airplane designs, it would have imposed a future requirement for new airplanes regardless of whether the shoulder harness was used.

2. Amend Part 23 to require structural design provisions to accommodate the installation of shoulder harnesses at all rear seat locations on newly certificated airplanes.

This alternative would have provided the opportunity to install shoulder harnesses, at the owner's option, without the need for structural modification. This alternative would not have been applicable to airplanes being manufactured under provisions of a current type certificate.

3. Amend Part 91 to require a shoulder harness at all seat locations on new airplane models; that is, those new airplane models manufactured under an amended type certificate, within a certain time period after the effective date of the amendment. Time periods of 1, 3, and 5 years were considered for this alternative.

This alternative was similar to alternative 1, except that the scope was broadened to include airplanes manufactured under an amended type certificate and a transition period was provided.

4. Amend Part 91 to require structural provisions to accommodate shoulder harnesses at all seat locations on new airplane designs.

5. Amend Part 91 to require shoulder harnesses at all seat locations on newly manufactured airplanes after a specified date.

6. Amend Part 91 to require structural provisions to accommodate the installation of shoulder harnesses at all seat locations on all small airplanes within a specified time period.

7. Amend Part 91 to require the installation of shoulder harnesses at all seats on all small airplanes after a specified time.

All airplanes which did not have provisions for shoulder harnesses would have been required to be modified to meet the crashworthiness standards of Part 23.

8. Amend Part 91 to require structural provisions to accommodate the installation of shoulder harnesses at all seat locations on small airplanes prior to the time of reregistration.

This would have required sellers or buyers to modify the airplane before registration to the new owner.

9. Make no regulatory changes.

The FAA's Civil Aeromedical Institute (CAMI) completed a report in March 1982 entitled "Crashworthiness Studies: Cabin, Seat, Restraint, and Injury Findings in Selected General Aviation Accidents," Report No. FAA-AM-82-7. Numerous accidents were reviewed for features of crashworthiness and, in particular, for the injuries to the occupants in relation to the apparent severity of the impact and the performance of the cabin and occupant restraint systems.

In concluding the review, an estimate of the value of shoulder harnesses was made by the investigators. In the 47 accidents selected by further review, there were 136 persons involved. Eighty-seven (87) of these 136 were occupying a pilot or copilot seat, and it was estimated that 42 of the 49 occupants in rear seats would have had less severe injuries had shoulder harnesses been available and used. From this study, it is clear that shoulder harnesses enhance the crashworthiness of an airplane and reduce the possibility of serious or fatal injuries to occupants of other seats, in addition to those occupying the front seats.

A review of the 1981 Benefit-Cost Analysis and the CAMI Report indicated a varying positive benefit-to-cost ratio for alternatives 1, 2, and 7. Because alternative 7 is of such complexity and cost, and because some of the data upon which the 1981 study was based has changed, the FAA is conducting further study of this alternative before deciding if regulatory action is needed. Some of the factors which lead to the conclusion that further study was necessary are as follows:

1. The 1981 benefit-to-cost estimates the overall costs to be from $287 million to $328 million and more recent information indicates even higher costs.

2. The cost of shoulder harness installation can vary appreciably from one airplane to another. For example, the owner of an airplane manufactured without the attachment points for shoulder harnesses or whose airplane requires structural strengthening would have to bear significantly greater expense than an owner whose airplane only requires the installation of shoulder harnesses.

3. Rather than retrofit all seats, it may be more appropriate to retrofit only those seats where it can be done at reasonable cost or to retrofit only the front seats because these seats have a much higher occupancy rate than the rear seats and, correspondingly, the benefit-to-cost ratio will be significantly higher.

The FAA requested information from the public relating to the practicality of requiring the retrofitting of existing small airplanes with shoulder harnesses at all seats in Notice No. 85-11. In response to the request information, the FAA received little information either to support or to reject further rulemaking action on the retrofit issue.

Alternatives 1 and 2 were rejected because alternative 5, based upon new information and proposed in Notice No. 85-11, would provide much greater benefits than those in alternatives 1 and 2. In preparing the benefit-to-cost analysis for alternative 5 of the 1981 analysis, "Amend Part 91 to require the installation of shoulder harnesses at all seat locations on newly manufactured airplanes after a specified date," it was assumed that the cost would include the design, installation of provisions for shoulder harnesses, and the shoulder harness. Further, the actual installation cost of shoulder harnesses at each seat is now estimated at $150 to $250 per seat, because the attaching means for these shoulder harnesses will be provided in the affected airplane. Prior to developing Notice No. 85-11, the FAA was informed by the General Aviation Manufacturers Association, that after December 31, 1984, their newly manufactured small normal, utility, and acrobatic airplanes with a passenger seating configuration, excluding pilot seats, of nine or less, would have structural provisions incorporated and the member companies would be voluntarily installing shoulder harnesses where practical.

The GAMA manufacturers, which produce the majority of small airplanes, indicate that, except for airplanes purchased by Part 135 operators, they will, where practical, voluntarily provide structural provisions and install shoulder harnesses at all seat locations in these small airplanes. Accordingly, a review of the benefit-to-cost analysis has shown that alternative 5 would now have positive benefits relative to the estimated costs. Consequently, the FAA concluded that the objective of alternative 5 would be more economically viable than alternatives 1 or 2. The substance of alternative 5 was proposed in Notice No. 85-11. For those small airplane manufacturers, which are not members of GAMA, the one year compliance period requiring the installation of shoulder harnesses at all seat positions on newly manufactured small airplanes was considered a reasonable length of time.

DISCUSSION OF COMMENTS

In response to Notice No. 85-11, the FAA received comments from 19 interested persons. Most comments express agreement with the proposal.

One commenter states that, while favoring the proposal, amending § 23.785 addresses but one part of an overall absence of meaningful crashworthiness criteria within Part 23 of the FAR. This commenter contends the proposal is more form than substance until such time as the ultimate inertia forces set forth in § 23.561 are increased. The FAA does not agree with these remarks. Numerous studies by the FAA, NTSB, and others indicate that a significant improvement is made in small airplane crashworthiness by the installation and use of shoulder harnesses. While the Small Airplane Airworthiness Review Program (48 FR 4290, January 31, 1983), addresses the commenter's proposed increase in the ultimate static inertia forces of § 23.561(b)(2), a more appropriate course of action is to consider a dynamic testing requirement for seats and restraint systems simulating the survivable crash event and establishing criteria for occupant protection.

Two commenters contend that Technical Standard Order (TSO)-C22f, Safety belts, must be amended. One commenter states that TSO-C22f should be amended to require that the minimum standards for safety belt and shoulder harness systems be sufficient to restrain people equivalent to the 95th percentile man under foreseeable and survivable crash forces in a dynamic crash environment with due consideration for the geometry of each particular installation. The commenter also states, that a 500 percent increase in the specified values to which restraint systems are presently required to be designed and manufactured under a TSO would have minimum economic impact. The second commenter provides detailed changes to be considered in amending TSO-C22f. The FAA has a program to consider dynamic testing of seats within Part 23 of the FAR and shoulder harnesses in this respect are considered a part of the airplane seats. In addition, the FAA has a program to amend TSO-C22f.

One commenter notes that the language used by the National Highway Traffic Safety Administration (NHTSA) and the FAA is substantially different in the area of passenger restraint systems. The commenter suggests that conformity of the FAA rulemaking to terminology now used throughout the passenger restraint industry (i.e., pelvic restraint; upper torso restraint) would impact favorably on the introduction of occupant restraint systems currently existing into the aviation industry in a form more closely aligned with the state-of-the-art. The FAA is aware of the differences in terminology between NHTSA regulations and those proposed by the FAA with regard to occupant restraint systems. The FAA considered the use of the term "upper torso restraint" instead of the term "shoulder harness" in the proposal. Since many of the Federal Aviation Regulations use the term "shoulder harness" and the aviation community readily identifies with this terminology, the term "shoulder harness" is retained in these amendments.

One commenter suggests that the safety benefits of the proposed rule would be significantly enhanced by requiring that manufacturers make available, within one year following the effective date of the amendment, shoulder harness kits suitable to retrofit previously produced airplanes of types in current production with "upper torso restraint systems" capable of satisfying the amended rule. The commenter further recommends that a subsequent date should then be established (e.g., two years thereafter) upon which installation of such modification kits by all owners would become mandatory. However, another commenter recommends that the installation of shoulder harnesses on existing airplanes remain on a voluntary basis. This issue is one of the subjects of a current FAA study to determine the economic viability of alternative 7. Shoulder harness retrofit kits for all seats are presently available from the manufacturers of nearly all small airplanes. Upon completion of the FAA study, a decision will be made on whether to proceed with further rulemaking.

One commenter requests that the proposal be revised to provide for the installation of aft-facing or club seating arrangements in airplanes with a seating capacity of six or more without installing shoulder harnesses for aft-facing seats since the seat back must be designed to withstand the inertia forces prescribed in § 23.561(b)(2) to comply with § 23.785(j) of the FAR. The FAA disagrees. A shoulder harness on an aft-facing seat will provide lateral restraint in many airplane accidents where motion is not parallel to the longitudinal axis of the airplane and also provides rebound protection.

One commenter states that although no specific mention of side-facing seats is made in the regulations, it would appear that installation of shoulder harnesses on these type seats might enhance injuries when occupants are subjected to the inertia forces of § 23.561(b)(2), and, therefore, there should be other means of protecting occupants of side-facing seats. This commenter suggests a requirement similar to § 23.785(e), which is applicable to berths. The FAA recognizes that providing an equivalent level of safety on side-facing or club seats may present the designer a more difficult task than forward- or aft-facing seats. Furthermore, the commenter did not provide any information or data on how a level of safety could be provided that would be equivalent to that which would accrue from the installation of shoulder harnesses on forward- and aft-facing seats.

The FAA does not have adequate data to define safety provisions for side-facing seats or club seating equivalent to that afforded in a forward- or aft-facing seat with a shoulder harness and does not consider the berth requirements to be adequate for seats. This rulemaking action defines the occupant restraint requirement for forward- and aft-facing seats and, if an applicant chooses to provide different seating arrangements, that applicant must provide adequate data to substantiate that those seating arrangements provide an equivalent level of safety. The FAA is clarifying the requirements being adopted in § 23.785(g) by stating that for seat orientations other than forward- and aft-facing, the seat and restraint means must be designed to provide a level of occupant protection equivalent to that provided for forward- and aft-facing seats with safety belts and shoulder harnesses installed in normal, utility, and acrobatic category airplanes. Also, in light of the proposal to adopt a commuter category airplane within Part 23 as set forth in Notice No. (83-17 (48 FR 52010, November 15, 1983), the FAA plans to retain the standards in effect on the date of issuance of Notice No. 83-17 respecting seat and shoulder harness requirements for commuter category airplanes.

One commenter expresses a hope that, concurrent with the installation of shoulder harnesses at every seat, the manufacturers will make a serious attempt to improve the function and comfort of occupant restraint belts. This commenter contends that many shoulder harness designs are not well matched to the range of human body forms and are extremely uncomfortable, even during short term use. In addition, this commenter states many current designs do not easily allow scanning of the airspace by pilots for potential traffic since the shoulder harness is unnecessarily restrictive and does not allow significant upper torso movement. Another commenter, in opposing the proposal, recommended that the FAA expend an effort in getting a proper aviation restraining device for the pilot and copilot's seats of existing airplanes. The FAA recognizes that improvements could be made over currently installed shoulder harnesses and is, therefore, requiring compliance with the requirements of § 23.785(h) for the flightcrew member seats of all newly manufactured airplanes by adoption of new §§ 23.2 and 91.33(b)(14).

One commenter states that the current 40 percent usage rate of shoulder harnesses needs to be improved. This commenter recommends that § 91.14(a)(3) be amended to require each occupant to use that available shoulder harness for takeoff and landing. The

FAA agrees since the mere availability of shoulder harnesses does not achieve the purpose of having harnesses installed. Therefore, the FAA amends § 91.14(a)(3) as suggested by this commenter in order to achieve the level of safety intended by this rulemaking action. This commenter contends that a further improvement to safety could be made if each occupant were required, while en route, to keep the safety belt properly secured about his/her person while seated. The FAA agrees that this is a prudent practice but does not agree that the Federal Aviation Regulations should be amended to make this practice mandatory. Passengers can clearly visualize the need for properly secured restraint devices during takeoffs and landing, but cannot visualize such a need in routine nonturbulent flight. Requiring restraint devices to be secured without a clear and identifiable need would tend to dilute the effectiveness of the requirement of § 91.14(a)(3), as adopted by this rulemaking.

The previous commenter states that, at the present time, because shoulder harnesses are optional, seats and safety belts in combination or by themselves must accommodate the loads prescribed in § 23.561. Additionally, the commenter contends that since the shoulder harness can transfer large loads directly to the fuselage, the shoulder harness could possibly carry a large portion of the precribed 9*g* load in a particular seat/safety belt/shoulder harness system. When the shoulder harness is made mandatory, this commenter states, designers will be in a position to reduce the strength of the seat/safety belt combination and meet the standard on the basis that the combined seat/safety belt/shoulder harness system accommodates the precribed load. This commenter contends that the seat/safety belt combination, of itself, should continue to be required to withstand the precribed load of 9*g*, as should the shoulder harness, and the entire seat/safety belt/shoulder harness system. The FAA agrees that there should not be a lowering of the strength requirements for safety belts regardless of their combination with shoulder harnesses. This amendment does not revise the safety belt strength requirements of § 23.1413, but adds the shoulder harness requirements to the airworthiness standards of § 23.785(g). In response to this comment, the FAA requires each safety belt and shoulder harness to comply with § 23.1413, which must meet the load prescribed in § 23.561(b)(2).

Two commenters oppose the proposal with regard to the installation of shoulder harnesses in newly manufactured airplanes to be operated in air commerce for compensation or hire, and in scheduled passenger operations pursuant to Part 135 of the FAR. One of these commenters contends that the FAA ignored that part of its petition for rulemaking which stipulated that the shoulder harness installation should not be applicable to airplanes operated in air commerce for compensation or hire under Part 135 with a passenger seating configuration, excluding pilot seats, of nine or less. In response to this comment, the FAA did not ignore that part of the petition which stipulated that shoulder harnesses should not be applicable to airplanes operated pursuant to Part 135. The FAA evaluated the merits of this aspect and concluded that, irrespective of the type of operation, all newly manufactured normal, utility, and acrobatic category airplanes with a passenger seating capacity, excluding pilot seats, of nine or less should have shoulder harnesses installed at all seat positions. Arguments presented by the commenters do not persuade the FAA that the proposal should be changed. In support of Notice No. 85-11, the FAA's report entitled, "Crashworthiness Studies: Cabin, Seat, Restraint, and Injury Findings in Selected General Aviation Accidents", which is cited in the background paragraph of this amendment, concluded that shoulder harnesses enhance the crashworthiness of an airplane, and, thus, reduce the possibility of serious or fatal injuries to occupants of other seats, in addition to those seats occupied by the pilot and copilot or other front seat passenger. The second of these commenters states that the United States regional and commuter airlines currently operate 721 airplanes of nine or less passenger seats in scheduled Part 135 passenger service, of which 219 are single-engine airplanes. In addition, this commenter states that four basic types account for 64 percent of all airplanes of this size: the Cessna 206/207 series, the Cessna 402/404 series, the Piper PA-31 piston engine derivatives, and the Britten-Norman Islander series. The commenter states that these airplanes are equipped by the manufacturers with "airline interior options" and are completed different from the normal interior options purchased by personal and business use customers. It is contended that because the commuter airlines presently operate a substantial number of airplanes of the affected size (as well as large airplanes) not equipped with shoulder harnesses, these operators do not want to introduce shoulder harnesses to their fleets. It is alleged that this reluctance is not due to a lack of awareness of safety, but rather stems from concern over the confusion and perceptions that will ensue among passengers boarding some commuter airplanes equipped with shoulder harnesses and some without shoulder harnesses. This commenter cites the safety records from the 1984 NTSB statistics as 1.14 accidents per 100,000 flight hours for scheduled Part 135 operations, 4.24 accidents per 100,000 flight hours for on demand air taxi Part 135 operations, and 9.82 accidents per 100,000 flight hours for general aviation operations. The FAA recognizes, as this second commenter states, that the safety record of Part 135 scheduled passenger operations has been substantially better than the safety record for other types of operation with airplanes having nine or less passenger seats. In addition, this commenter contends that airplanes of the same type have a greater utilization rate in both number of flights and number of passengers carried in scheduled Part 135 operations than does the same type of airplane used in personal or business use; however, the high rate of use in Part 135 operations relative to the same airplane models in general aviation use exposes a substantially larger number of people to the unlikely event of an accident. Therefore, the installation of shoulder harnesses at all seats provide an enhanced level of safety to a larger number of people for these airplanes when used in Part 135 operations. Relative to possible passenger confusion and perceptions among passengers relative to some airplanes having shoulder harnesses and some not having shoulder harnesses, the commenter did not state the nature of the anticipated confusion and perceptions and the FAA does not visualize any effect on the resulting level of safety—only the passengers might ask questions concerning the installation of the shoulder harnesses on new airplanes used in Part 135 operations. This same commenter also contends that the additional maintenance and passenger briefing effort would pose a very large burden on the Part 135 operators. This commenter presents neither information nor data to support this contention. The FAA does not agree that the installation of shoulder harnesses would impose any significant additional maintenance or briefing effort on Part 135 operators as maintenance and briefing efforts are presently required with respect to the safety belts in the affected airplanes.

One commenter contends that the implementation of the proposal is a gesture in futility disguised as safety and the only results will be more litigation directed at pilots and owners alleging neglect to properly brief passengers. This commenter states that there is no possible way of enforcing the requirements and will be pressed to get passengers to do that which they do not have to do on a commercial carrier. The FAA does not agree. This commenter presented no information to support the contention of more litigation or that passengers will not use shoulder harnesses for takeoffs and landings when available. In addition, § 13.1 of the FAR addresses the issue of reporting to the FAA any known violation of any regulation or order issued pursuant to the Federal Aviation Aviation Act of 1958, as amended, and § 91.3 places the responsibility for operation of an airplane upon the pilot.

Another commenter states that the installation of shoulder harnesses in new airplanes is an unnecessary expense and the only thing that the proposal will do is raise the price of airplanes. The FAA does not agree that the installation of shoulder harnesses in new airplanes is an unnecessary expense because of the number of fatalities and serious injuries that will be prevented. With regard to raising the price of airplanes, those manufacturers which are GAMA members are presently installing on a voluntary basis shoulder harnesses at all seat positions and, therefore, no additional expense is being incurred that is not currently present in the price of new airplanes from these firms.

Sections 21.17 and 21.101 are amended to reference new § 23.2. These amendments are considered nonsubstantive, but are necessary to ensure that § 23.785, which is being made mandatorily retroactive, will be complied with and incorporated in the type certificate, amended type certificate, or supplemental type certificate, as appropriate. New § 23.2 could affect pending applications for type certificates at the time § 23.2 becomes effective. Also, compliance with § 23.2 for newly manufactured airplanes which were previously type certificated would require an amended type certificate or a supplemental type certificate. Accordingly, reference to new § 23.2 is needed in §§ 21.17 and 21.101.

The FAA is deleting the phrase "with a passenger seating configuration, excluding pilot seats, of nine or less" at the end of § 23.785(g), as stated in the notice. This phrase is redundant because of the general applicability of Part 23 with respect to the normal, utility, and acrobatic categories of airplanes, as set forth in § 23.1. New applications for a type certificate pursuant to Part 23 for normal, utility, and acrobatic category airplanes, is limited to airplanes with a passenger seating configuration, excluing pilot seats, of nine or less.

ECONOMIC IMPACT

The economic impact information provided below was prepared from the Final Regulatory Analysis.

It is estimated that the cost of a shoulder harness is about $150 to $250 per unit. The relatively high cost in relation to automobile seat belts is because of the low production volume and the requirement to carefully install the shoulder harness to make certain it is properly aligned. The life of a shoulder harness is estimated to be 10 years, depending on use, the timing of seat replacement, and the effects of sunlight on the belting material.

The benefit of a shoulder harness is the reduction in casualty loss attributable to the shoulder harness, that is, the number of lives and injuries saved by those using the shoulder harnesses who would have been killed or injured if they had not used the shoulder harness.

There were 480,000 passenger seats in the active general aviation fleet in 1981. There was an average of 607 passenger fatalities per year for the period 1979 through 1981. Therefore, the average fatality rate over the entire general aviation fleet was 126 per 100,000 seats.

The NTSB has conducted an analysis of 1982 accidents in which the utility of shoulder harnesses was evaluated. In these accidents, 40 percent of the occupants were wearing shoulder harnesses when available, and this was the estimate used for the calculation of benefits in the NPRM. Since this amendment revises the NPRM's proposal to now require each occupant to use the available shoulder harness for takeoff and landing, and because there has been an active education program by the general aviation community and the FAA to promote the use of shoulder harnesses, the FAA now estimates that shoulder harness use will increase to 60 to 80 percent. For the purpose of this analysis, 70 percent will be the estimated usage rate.

NTSB estimated that about 20 percent of the people killed could have survived if they had been wearing shoulder harnesses. Therefore, shoulder harnesses are likely to save about 17.6 people per 100,000 seats per year (70% of 20% × 126 fatalities per 100,000 seats). The FAA in 1984 valued a life at $670,000. Thus, over a 10 year period, the life of a shoulder harness, there would be a reduction in fatalities valued at $118 million for 100,000 seats. The cost of equipping these seats with shoulder harnesses is $20 million ($200 per seat × 100,000 seats). Since lives will be saved uniformly over the ten year period and the shoulder harness investment will be made in the first year, the benefit to cost ratio is about 3.5 taking into consideration the time value of money (the FAA uses 10%).

There was only one comment relating to the cost and benefits. One commenter indicates that Part 135 scheduled passenger operations is nine times safer overall than general aviation flying and, therefore, there was not as great a need for shoulder harnesses for this aviation segment. This comment was addressed in a previous section.

Additional detail relating to the economic impact can be found in the Regulatory Evaluation which has been placed in the docket.

TRADE IMPACT

This rule would have little or no impact on trade for both U.S. firms doing business in foreign countries and foreign firms doing business in the U.S.

In the U.S., foreign manufacturers would have to meet U.S. requirements, and, thus, they would gain no competitive advantage. In foreign countries, U.S. manufacturers can be competitive by either installing or not installing shoulder harnesses depending on requirements. There were no comments relating to trade impact.

REGULATORY FLEXIBILITY DETERMINATION

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by government regulations. The RFA requires agencies to review rules which may have a significant economic impact on a substantial number of small entities.

The FAA's criteria for a small manufacturer is one with less than 75 employees, a substantial number is one which is not less than 11 and which is more than one-third of the small entities subject to the proposed rule, and a significant impact is one having an annual cost of more than $13,700 in 1984 dollars per manufacturer.

A review of the aircraft manufacturers indicates that there are less than eleven "small" manufacturers. In addition, members of the General Aviation Manufacturers Association (GAMA) are voluntarily installing shoulder harnesses and, therefore, this amendment will not impact these manufacturers whether large or small.

There were no comments relating to the initial regulatory flexibility determination.

CONCLUSION

The FAA has determined that this document involves regulations which are not considered to be major under the procedures and criteria prescribed by Executive Order 12291. However, this document is considered to be significant under Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). A copy of the regulatory evaluation prepared for this action is contained in the regulatory docket. A copy may be obtained from the person identified as the contact for further information. Furthermore, the FAA certifies that this regulation will not have a significant economic impact on a substantial number of small entities under criteria of the Regulatory Flexibility Act since few, if any, small entities are involved. In addition, this final rule will have little or no impact on trade opportunities for U.S. firms doing business overseas or for foreign firms doing business in the United States.

In consideration of the foregoing, the Federal Aviation Administration amends Parts 21, 23 and 91 of the Federal Aviation Regulations (14 CFR Parts 21, 23, and 91) effective December 12, 1985.

AUTHORITY: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C. 1857f-10, 4321 et. seq.; E.O. 11514; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

Amendment 21-59

Airworthiness Standards and Operating Rules: Commuter Category Airplanes

Adopted: January 8, 1987 **Effective: February 17, 1987**

(Published in 52 FR 1806, January 15, 1987)

SUMMARY: These amendments to Parts 21, 23, 36, 91, and 135 of the Federal Aviation Regulations (FAR) adopt certification procedures, airworthiness and noise standards, and operating rules for an additional category of propeller-driven, multiengine airplane, designated as the Commuter Category. The amendment to Part 21 allows certification of commuter category airplanes by the same procedures applicable to other aircraft. The amendment to Part 23 adds airworthiness standards for airplanes with a maximum seating capacity, excluding pilot seats, of 19 or less, a maximum certificated takeoff weight of 19,000 pounds or less, and requires type certification compliance with the International Civil Aviation Organization (ICAO) Annex 8, Part III, requirements which apply to airplanes weighing in excess of 5,700 kilograms (12,566 pounds). The amendment to Part 36 adopts noise standards applicable to small, propeller-driven airplanes to be certificated in the commuter category. Parts 91 and 135 are amended to prescribe rules governing the operation of commuter category airplanes as required by the general operating and flight rules.

Since 1966, the FAA has been applying various additional airworthiness requirements to the certification of small airplanes, intended for use in air taxi operations, to achieve an acceptable level of safety when the affected airplanes are so utilized. These additional requirements were set forth in special conditions, Special Federal Aviation Regulation (SFAR) No. 23, Part 135, Appendix A, SFAR 41. The SFARs were temporary rules intended only to provide relief to the industry and public from the lack of suitable certification procedures and standards while the FAA developed permanent rules. SFAR 23 ceased to be applicable after July 19, 1970, and SFAR 41 expired on September 13, 1983. This final rule, which adds the new commuter category, will set forth airworthiness requirements in Part 23 for airplanes intended for use in commercial operations. As a result of this action, airplanes certificated in the commuter category will achieve a level of safety requisite for commercial operations.

This document also requests comments on new seat and weight demarcations between small and large airplanes.

DATES: The effective date of these amendments is February 17, 1987. The closing date for comments is March 16, 1987.

ADDRESS: Comments on the proposed new demarcation lines are to be marked "Docket No. 23516" and mailed in duplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attn: Rules Docket (Docket No. 23516), 800 Independence Avenue, S.W., Washington, D.C. 20591; or deliver comments in duplicate to: Room 916, 800 Independence Avenue, S.W., Washington, D.C. Comments may be inspected at Room 916 on weekdays, except Federal holidays, between 8:30 a.m. and 5 p.m.

FOR FURTHER INFORMATION CONTACT: J. Robert Ball, Regulations and Policy Office (ACE-110), Aircraft Certification Division, Central Region, Federal Aviation Administration, 601 East 12th Street, Kansas City, Missouri 64106: Telephone (816) 374-5688.

SUPPLEMENTARY INFORMATION:

Regulation History

These amendments are based upon a Notice of Proposed Rulemaking, Notice No. 83-17, published in the *Federal Register* on November 15, 1983 (48 FR 52010). All comments received in response to Notice No. 83-17 were considered in adopting these amendments.

Background

Since 1953, the airworthiness standards have distinguished small from large airplanes by a 12,500 pound maximum certificated takeoff weight (MCTW) limitation regardless of the type of operation. When this weight limitation was established, little concern was expressed that this demarcation would eventually become questionable with regard to airworthiness standards for an airplane of the commuter category. At that time, there were few airplane designs near this 12,500 pound limitation; i.e., they were either considerably above or below that weight.

In 1966, the FAA established an air taxi airworthiness program with the objective to provide a transition for air taxi airplanes from the small airplane requirements of Part 23 to the transport category airplane requirements of Part 25. That program resulted in the issuance of Special Federal Aviation Regulation No. 23 (34 FR 189; January 7, 1969). An additional step in the upgrading of airworthiness standards for reciprocating-engine and turbopropeller-powered small airplanes used in Part 135 operations was the adoption of an Appendix A to Part 135 (35 FR 10098; June 19, 1970) which set forth additional airworthiness standards for airplanes with ten or more passenger seats.

On July 7, 1970, the FAA issued Notice No. 70-25 (35 FR 10911) proposing to upgrade the level of airworthiness of small airplanes intended for operations under Part 135. In response to the comments received to Notice No. 70-25, and after further consideration, the FAA determined to limit the future applicability of Part 23 to small normal, utility, and acrobatic category airplanes with a seating configuration, excluding pilot seats, of nine or less. At that time this action was considered more appropriate than adding additional airworthiness requirements to Part 23. This action was based upon a trend toward an increase in the number and types of airplanes designed to carry relatively large numbers of passengers. At that time, the FAA considered that continued applicability of Part 23 to small airplanes designed to carry ten or more passengers was no longer in the interest of safety and future generations of these small airplanes should adhere to the level of safety afforded by the requirements of Part 25, irrespective of whether operations were conducted under Part 135 or Part 91. Thus, Amendment 23-10 limiting the number of seats, excluding pilot seats, to nine or less became effective March 13, 1971, and is applicable to normal, utility, and acrobatic category airplanes for which an application for a type certificate is received by the FAA after the March 13, 1971, date.

On August 29, 1977, the FAA issued Notice No. 77-17, (42 FR 43490) Part 135 Regulatory Review Program, proposing, in part, to prohibit the operation, after certain dates, of reciprocating engine or turbopropeller-powered small airplanes not certificated in the transport category and having a passenger seating configuration of ten or more seats. Before the closing date for comments on November 28, 1977, the FAA withdrew this part of the proposal in Notice No. 77-17. The more significant reasons given for the withdrawal are (1) comments on this proposal showed its effect would virtually destroy the commuter airline industry and deprive the general public of needed transportation; (2) the proposal had already disastrously effected the industry; (3) airplane sales had been cancelled and operators had serious difficulty with financing; and (4) the cost of complying with the proposal would exceed 300 million dollars for an industry whose total profits did not exceed 50 million dollars a year.

Consequently, the FAA determined that the proposal should not be retained as part of the proposed new Part 135. The FAA did note that the withdrawal of the proposal did not preclude the FAA from issuing similar proposals in the future due to a change in circumstances nor commit the FAA to any course of action. The FAA encouraged further comments on this issue.

The FAA/Industry Commuter Aircraft Weight Committee submitted a petition to amend the regulations to allow certain small airplanes to be type certificated at maximum certificated takeoff weights greater than the 12,500 pound limitation without complying with the transport category airworthiness requirements of Part 25. Responding to this petition and other needs for improved standards resulting from the Airline Deregulation Act, the FAA initiated a three-phase program for certification and operation of commuter airplanes. The first phase was the issuance of a revised Part 135—Air Taxi Operators and Commercial Operators (43 FR 46 FR 46742; October 10, 1978), which aligned the rules for thoses operations more closely with those of Part 121—Certification and Operations: Domestic, Flag, and Supplemental Air Carriers and Commerical Operators of Large Aircraft. The second phase, initiated by Notice No. 78-14 (43 FR 46734; October 10, 1978), proposed temporary rules stating the additional airworthiness requirements necessary to provide for increased takeoff gross weight and passenger seating capacity of certain existing small, propeller-driven, multiengine airplanes. The outcome of this Notice was the adoption of SFAR No. 41 (44 FR 53723; September 17, 1979), which became October 17, 1979. The third phase established the Light Transport Airworthiness Review, Notice No. 78-17 (43 FR 60846; December 28, 1978) to develop a separate set of airworthiness standards for multiengine airplanes with a maximum gross weight up to 35,000 pounds and a seating capacity up to 30 passengers. Subsequent considerations and recommendations from industry during the Review escalated the maximum weight and passenger capacity limits to 50,000 pounds and 60 passengers for the light transport category airplane. Nevertheless, the FAA terminated the Light Transport Airworthiness Review Program because, based on available information, the expected economic benefits resulting from a new light transport airplane airworthiness regulation would not be realized.

After the expiration of SFAR No. 41, as amended, on October 17, 1981, and termination of the Light Transport Airplane Airworthiness Review, the FAA reinstated SFAR No. 41, with amendments, as SFAR No. 41C, effective September 13, 1982 (47 FR 35150; August 12, 1982), for 1 year and subsequently started development of the commuter category requirements. Accordingly, Notice No. 83-17 (48 FR 52010; November 15, 1983) contained the proposed commuter category requirements.

This rulemaking package was initiated prior to the issuance on October 9, 1986, of NTSB Safety Recommendations A-86-98 through A-86-118, which deal with commuter airplane operating requirements. The FAA has not yet completed its review of those recommendations or developed its position on them. This rulemaking has no relationship with those recommendations and they have not been addressed in this document. If, after further review, the FAA finds it necessary to undertake additional rulemaking, we will do so.

DISCUSSION OF COMMENTS

General

Interested persons were invited to participate in the development of this final rule by submitting such written data, views, or arguments as they may desire to the regulatory docket on or before February 14, 1984. In response to Notice No. 83-17, the FAA received 29 sets of comments.

In general, the comments received address five major issues: (1) past FAA actions relative to airworthiness standards for airplanes of a size similar to those proposed in Notice No. 83-17; (2) the level of safety provided by the commuter category airplane airworthiness standards; (3) required compliance with the minimum standards of the International Civil Aviation Organization (ICAO); (4) different levels of safety for similar 19-passenger airplanes with maximum certificated takeoff weights below 12,500 pounds and above 12,500 pounds; and (5) comments which address specific proposals, or the lack of proposals, given by section number of Part 23.

Two commenters cite past FAA actions as being inconsistent with the proposal of airworthiness standards in Part 23 for type certification of an airplane in the proposed commuter category. One of these commenters oppose the proposal and cities the adoption of Amendment 23-10, effective March 13, 1971, which restricted future Part 23 airplanes to nine seats or less, excluding pilot seats. This commenter notes that, at that time, the FAA considered future airplanes capable of carrying more than nine passengers should be type certificated to Part 25. The other commenter quotes various statements from the notices of the Light Transport Airworthiness Review program and the purpose stated for the proposed Part 24—Airworthiness Standards: Light Transport Airplanes, and questions the FAA action in issuing Notice No. 83-17.

In response to the comment addressing the adoption of Amendment 23-10, the various rulemaking activities subsequent to the adoption of that amendment evidence significant changes in circumstances. Lack of adequate standards resulted in an unworkable situation by requiring all future airplanes capable of carrying more than nine passengers to be type certificated to Part 25. The problems created by that requirement are evidenced by the Light Transport Airworthiness Review Program in which Part 24 was proposed and by the adoption of SFAR No. 41 and its subsequent amendments as interim measures. Amendment 23-10 does, however, continue to be applicable to type certification of normal, utility, and acrobatic category airplanes.

The Light Transport Airworthiness Review Program recognized that application of Part 25 airworthiness standards to a light transport airplane was inappropriate. As noted in Notice No. 78-17 (43 FR 60846, December 28, 1978), which initiated the Review, the FAA proposal for a Part 24 tried to establish a balance between the transport category requirements in Part 25 and the small airplane requirements in Part 23 which would maintain the level of safety believed appropriate for light transport airplanes carrying passengers for hire. The airworthiness standards of Part 24 were initially proposed for an airplane with a maximum seating capacity of about 30 passengers and a maximum weight of 35,000 pounds without regard to the type of powerplants. Upon termination of the Review, the parameters defining the light transport airplane extended to airplanes capable of carrying a maximum of 60 passengers and having a maximum weight of 50,000 pounds.

Based on the cited rulemaking efforts, the FAA does not consider the adoption of the new commuter category and the airworthiness standards for this category of airplane in Part 23 to be inconsistent with past actions by the FAA.

Information available to the FAA resulted in a determination, and industry has concurred, that a need exists for permanent airworthiness standards for an airplane of the size stated in Notice No. 83-17 and that an additional category of airplane should be established within Part 23. The FAA's alternatives were to relax the requirements of Part 25 to accommodate the new category or to propose additional airworthiness standards in Part 23 for the new category. The most appropriate course for the FAA was to propose the integration of additional standards into Part 23. The FAA considers the current airworthiness standards applicable to new type certification applications for normal, utility, and acrobatic category airplanes of Part 23, and the additional airworthiness standards of SFAR No. 41, as supplemented by those airworthiness standards necessary to comply with the minimum requirements developed by the International Civil Aviation Organization (ICAO) in Annex 8, Part III. The ICAO standards apply to airplanes weighing 5,700 kg. (12,566 lbs.) or more and to the carriage of passengers in international air navigation. The airworthiness standards of Appendix A of Part 135 not previously adoped in Part 23, which apply to airplanes with ten or more passenger seats, were also proposed for type certification of commuter category airplanes. The satisfactory service experience of propeller-driven, multiengine normal category airplanes recertificated to the additional requirements of SFAR No. 41 was drawn upon to support this course of action.

Several comments were received addressing the level of safety of the proposed commuter category airplane. As stated in the Notice, the level of safety established by the proposed airworthiness standards for the new commuter category are considered, to the maximum feasible extent, equivalent to those provided by the airworthiness standards for larger airplanes used in air transportation. In this determination, the FAA considered the following: (1) the airworthiness standards of Part 23, including all current amendments, would apply as a type certification basis for the commuter category; (2) the commuter category is limited to propeller-driven, multiengine airplanes and a maximum seating, excluding pilot seats, of 19 passengers; (3) the airworthiness standards for all commuter category airplanes up to and including the maximum certificated takeoff weight of 19,000 pounds must comply with those standards established by ICAO for airplanes weighing 5,700 kg or more, (4) the compartment interior requirements are equivalent to those set forth in Part 25 at the time Notice No. 83-17 was issued, irrespective of maximum weight of the commuter category airplane; and (5) engine fire detector and fire extinguishing systems are required for type certification of any commuter category airplane. The FAA will continue to review the airworthiness standards for commuter category airplanes and propose improvements and updates, when necessary, to maintain the level of safety intended for airplanes to be used by commuter airlines and when shown to be in the public interest.

The FAA received numerous comments supporting the proposal. However, eight of the commenters use the phrase "special commuter category." The Federal Aviation Regulations and predecessor regulations have for many years addressed airworthiness standards for four categories of airplanes; i.e., normal, utility, acrobatic, and transport. This discussion does not include the restricted and limited categories which have specific applicability. The FAA assumes that the commenters are misinterpreting the word "special" if they are using it as a carryover from the temporary Special Federal Aviation Regulation No. 41 which contained the additional airworthiness standards for recertification of certain small airplanes with increases in maximum weight or passenger seats or both. The commuter category is not "special." It is a new category of airplane being established by this rulemaking.

Two commenters oppose mandatory compliance with the ICAO Annex 8, Part III requirements on the basis that, to date, the performance requirements have been applied to SFAR No. 41 certificated airplanes only when it was necessary to meet the international requirements of ICAO Annex 8. They assert that compliance with the ICAO requirements should be optional. One commenter contends that the ICAO rules generally represent the essential elements of Part 25 performance requirements and the inclusion of overly stringent and economically burdensome requirements are not essential to ensure the safety of modern airplanes to which the new commuter category airworthiness standards will apply. Furthermore, one commenter requests that the proposal be revised to restore the current SFAR No. 41 performance requirements; i.e., to permit Part 135 Appendix A performance for commuter category airplanes. In support of the commenter's position, the commenter submits plots showing the number of airports in the United States that could not be served due to the performance limitations of two currently certificated SFAR No. 41 airplanes.

On the other hand, several commenters, including an airline association, a foreign airplane manufacturer, and foreign civil airworthiness authorities support the proposal that the commuter category airplane comply with the ICAO Annex 8, Part III, requirements. One commenter contends that the performance of commuter airplanes has, in past years, been marginal in cases of engine failure and that the proposal to add ICAO Annex 8, Part III to commuter standards, bringing the commuter airplanes into conformity with international standards, will provide an additional protection and, therefore, endorses the proposal.

Two commenters contend that the provisions of section 1(a) of SFAR No. 41 should be incorporated into the proposed commuter category requirements in Part 23. This would allow type certification of airplanes in the comuter category with ten or more passenger seats (up to 19 seats) and a maximum weight of 12,500 pounds or less by compliance with regulations incorporated in the type certificate and only the additional requirements in Appendix A, of Part 135. This would also result in a dichotomy of the airworthiness standards for commuter category airplanes weighing up to 12,500 pounds and those weighing above 12,500 pounds.

The main argument presented by these commenters is that omission of section 1(a) of SFAR No. 41 from the proposed commuter category rule is inconsistent with the International Civil Aviation Organization (ICAO) standards of Annex 8. The ICAO standards differentiate the airworthiness requirements for airplanes weighing up to 12,500 pounds and those weighing more. Airplanes weighing more than 12,500 pounds must comply with Annex 8, Part III, while those weighing less than 12,500 pounds may comply with lesser requirements.

The FAA does not agree that the current requirements in SFAR No. 41 provide adequate or appropriate requirements for type certification of newly designed airplanes in the new commuter category. The Federal Aviation Act of 1958, as amended, addresses the level of safety in air transportation provided by air carriers in at least two specific sections. First, Section 601(b) states, in part, ". . .the Secretary of Transportation shall give full consideration to the duty resting upon air carriers to perform their services with the highest possible degree of safety in the public interest and to any differences between air transportation and other air commerce." Secondly, section 419(c) states, in part, ". . .the Administrator, by regulation, shall establish safety standards (A) for aircraft being used by commuter air carrier . . . Such safety standards . . .shall impose requirements upon such commuter air carriers to assure that the level of safety provided to persons traveling on such commuter air carriers is, to the maximum feasible extent, equivalent to the level of safety provided to persons traveling on air carriers which provide service pursuant to certificates isssued under Section 401 of this title."

The ICAO airworthiness standards proposed for the commuter category airplane are the minimum standards to ensure safety of airplanes over-flying another contracting state. Contracting states, such as the United States, may establish standards which provide a higher level of safety than the ICAO minimum standards. The passenger capacity and proposed commercial service use are more meaningful parameters to delineate airworthiness safety standards than is airplane weight. Associating airworthiness standards with the number of passengers carried is also consistent with the nine passenger seat limitation requirement currently applicable to normal, utility, and acrobatic category airplanes. The proposed airworthiness standards are the minimum required in the interest of safety and form an integral part of the level of safety achieved by air carriers. Therefore, no changes in the proposal are made.

Several commenters contend that the production limitation date of Ocotober 17, 1991, for SFAR No. 41 airplanes should be eliminated and production of currently certificaed SFAR No. 41 airplanes should be permitted for an indefinite period of time.

In response to these comments, we note that SFAR No. 41 was promulgated to meet an immediate need for the emerging commuter airline industry. That SFAR was predicated on the application of additional airworthiness standards for existing type certificated normal category airplanes that had demonstrated a good safety record. At the time SFAR No. 41 and its subsequent amendments were adopted, they provided airworthiness standards which met the mandate of the Congress regarding the safety standards for airplanes used by commuter air carriers. The temporary airworthiness standards of SFAR No. 41 served the purpose for which they were intended and established the necessary level of safety mandated by Congress. In any case, newly manufactured airplanes which are certificated under SFAR No. 41 will not be required to comply with these requirements.

One commenter states that Part 23, as amended, by this final rule should provide for airplanes with ten or more passenger seats and a maximum certificated takeoff weight of 12,500 pounds or less, citing paragraph 1(a) of SFAR No. 41 as the reason for such a provision. Additionally, several commenters contend that certification of airplanes in the commuter category should be permitted by complying only with the additional requirements applicable to the commuter category and those requirements stated in the previous type certification basis of their airplane.

The FAA does not agree that the commuter category should differentiate between airplanes that weigh less than 12,500 pounds and those that weigh more than 12,500 pounds. Furthermore, the FAA has concluded that a certification basis for the new commuter category should include all current amendments of Part 23 plus all of the airworthiness standards of SFAR No. 41 in order to achieve the appropriate level of safety. The proposed requirements for fuel tanks, fire extinguishing systems, fire extinguishing agents, compartment interiors, fuel system components crashworthiness, and landing gears are essential to the level of safety expected of airplanes to be type certificated in the new commuter category, irrespective of the weight of the airplane. Certification of airplanes to only the SFAR No. 41, paragraph 1(a) requirements would permit certification of airplanes with a seating configuration, excluding pilot seats, of 19 or less without complying with the above requirements.

The traveling public is entitled to the protection afforded by these safety requirements regardless of whether the commuter category airplane has a maximum certificated takeoff weight above or below 12,500 pounds. In addition, the FAA has had several airworthiness review programs of the airworthiness standards for Part 23 airplanes. The purpose of these airworthiness reviews has been to improve and update the airworthiness and crashworthiness standards applicable to the type certification of new small airplane designs and many of the airworthiness standards required by paragraph 1(a) of SFAR No. 41 have subsequently been adopted into Part 23 for new designs of airplanes in the normal, utility, and acrobatic categories. These requirements alone are not considered adequate for commuter category airplanes and must be supplemented as set forth in Notice No. 83-17 for commuter category type certification.

The FAA received comments in support of the proposal which contend that the proposal is equivalent to the airworthiness standards of the proposed Part 24 for the light transport airplane. The FAA does not agree that the airworthiness standards for the commuter category airplane are equivalent to those of the recently proposed Part 24. Some of the reasons for this disagreement are the unrestricted use of powerplants, the size, and maximum weight of the proposed Part 24 airplane and airworthiness standards directly related to airplanes of this size.

Six additional commenters in support of the proposal, operators of SFAR-41 airplanes, stated that redesign of the 19-seat commuter airplane to meet the requirements of Part 25 would be cost prohibitive. The information supplied by these commenters is consistent with that provided by commenter to a proposal in Notice No. 77-17 which would have required all airplanes operated under Part 135 after June 30, 1984 to meet Part 25 requirements. That proposal in Notice No. 77-17, comments received on it, and FAA reason for withdrawal of the proposal, is discussed earlier in the Regulatory History portion of this final rule. Based on the comments which resulted in the withdrawal of Notice No. 77-17 and these six comments, the FAA does not plan to propose that existing 19-seat commuter airplanes be redesigned to meet the requirements of Part 25.

One commenter suggests changes to Part 1 to redefine "small aircraft." No justification or reason to support a redefinition of "small aircraft" is offered. The suggested redefinition, therefore, is unnecessary.

Discussion of Comments to Specific Sections of Parts 21, 23, 36, 91, and 135.

The following comments and discussions are keyed to like-numbered proposals contained in the Notice, or to specific sections where the comments address sections not previously addressed in Notice No. 83-17. In Notice No. 83-17, proposals numbered 1 through 59 address Part 23; proposals 60 through 72 address Part 21, proposals 73 through 78 address Part 36, proposal 79 addresses Part 91, and proposals 80, 81, and 82 address Part 135.

Proposal 1—No comments were received in response to the proposed title change to Part 23. The title of Part 23 is adopted as proposed.

Proposal 2—No specific comments were received in response to the proposed amendment of § 23.1; however, general comments related to § 23.1 have been discussed under the previous general comments of this preamble. Section 23.1 is adopted as proposed.

Proposal 3—One commenter contends § 23.3(d) should be revised to provide for airplanes limited to 12,500 pounds maximum takeoff weight and a seating configuration, excluding pilot seats, of ten or more. The FAA does not agree. The airworthiness standards, adopted herein establish requirements for the commuter category, regardless of weight, from less than 12,500 pounds up to and including 19,000 pounds, or passenger seating configuration, excluding pilot seats, not to exceed 19.

One commenter recommends that § 23.3 be amended to require all airplanes used by scheduled air carriers to be certificated as commuter category since, under the present and proposed rules, airplanes of nine or fewer passenger seats will continue to be eligible for certification under existing Part 23 rules and not the enhanced commuter category rules. The FAA recognizes the merit of the comment and will consider additional rulemaking to enhance the level of safety of airplanes used by scheduled air carriers with a passenger configuration of nine or less when shown to be in the public interest or necessary for safety. The FAA considers this comment to be outside the scope of this rulemaking activity and one that cannot be adopted concurrently with these amendments without additional public participation in such a proposal.

Another commenter recommends that § 23.3(d) be changed to add single-engine, turbopropeller-powered airplanes to the commuter category. The FAA does not agree with the inclusion of single-engine, turbopropeller-powered airplanes within the commuter category. While the commenter contends that turbopropeller engines have a record of increased reliability over reciprocating engines, the prospect of a single-engine failure does not provide the level of safety expected from the airworthiness standards for commuter category airplanes which must have the ability for continued safe flight and landing after probable failures, including the failure of an engine.

One commenter questions the rationale and justification which restrict the commuter category to propeller-driven airplanes. The commenter contends that this restriction does not appear to enhance the airworthiness of the commuter category and could unduly restrict innovative designs. The scope of the proposal was limited to integrating into Part 23 the airworthiness standards as set forth in Notice No. 83-17, including those necessary to comply with the ICAO requirements. Since the airworthiness standards proposed in Notice No. 83-17 would apply to propeller-driven airplanes only, these standards are not considered adequate for other propulsion system designs. The comment is not germane to the scope of this final rule.

A minor clarifying change was made to proposed § 23.3(e) by inserting the word "type" before the word "certificated." This makes clear that certification in that paragraph was with reference to type certification and not to airworthiness certification.

It has been past FAA policy to issue an airworthiness certificate for an airplane in more than one category. However, for an airplane type certificated in both the normal and commuter categories, the FAA will not issue an airworthiness certificate for more than one category. This procedure is being established because of significant differences among the airworthiness, maintenance, and operating requirements applicable to normal and commuter category airplanes. Accordingly, for those airplanes that may be type certificated in both the normal category and the commuter category, an applicant may apply for a standard airworthiness certificate as either a normal or commuter category airplane, but not for multiple airworthiness certification in both categories. If the applicant selects airworthiness certification as a normal category airplane, the airplane must be operated as a small airplane with a seating configuration, excluding pilot seats, of nine or less in accordance with the normal category type certificate limitations for the airplane. Alternatively, if the applicant selects airworthiness certification as a commuter category airplane, the airplane must be operated in accordance with the commuter category type certificate limitations for the airplane.

Proposal 4—One commenter states that paragraph 4(a) of SFAR No. 41, as amended, requires the establishment of a maximum zero fuel weight and contends that § 23.25 should include such a requirement. The FAA agrees. Therefore, establishment of a maximum zero fuel weight by the applicant, as required in paragraph 4(a) of SFAR No. 41, is considered necessary and § 23.25 is revised accordingly to assure the airplane design considers the necessary operational limitations with variations between payload and fuel loads.

Proposal 5—One commenter states, for ICAO Annex 8 compliance, that an approach configuration must be selected. The FAA agrees that the applicant should determine the approach configuration since compliance with the airworthiness standards for commuter category airplanes requires performance in the approach configuration. Accordingly, § 23.45(f)(1) is changed by adding the word "approach" following the words "en route" in the requirements for airplane configuration selection by the applicant.

Another commenter recommends a statement of principle as a new paragraph (a) to be added to § 23.45 to read as follows, and subsequent paragraphs renumbered accordingly:

> "(a) The intended level of safety will be achieved only if the performance information, established and furnished in accordance with FAR 23, Subparts B and G, is used in conjunction with the performance operating rules of FAR 135.399 through FAR 135.403."

The commenter proposes revisions to § 135.399 and additional sections to Part 135. The FAA does not agree that a "statement of principle" should be included in § 23.45. The Federal Aviation Act of 1958, as amended, sets forth the requisite policy and principle with respect to airworthiness standards and operating rules for U.S. civil aircraft.

The previous commenter also recommends that § 23.45(f)(3) include reference to the "takeoff flight path" unless it is covered by ". . .the critical-engine-inoperative takeoff performance," and the landing distance. The FAA agrees with the recommendation and, for clarity, this general performance requirement has been revised to include "takeoff flight path" and "landing distance" in § 23.5(f)(3). Since § 23.1583, Operating limitations, requires this information to be included in the Airplane Flight Manual (AFM) for safe operation and since § 23.75 includes requirements for determining landing distances, § 23.45(f)(3) should include requirements that make it clear that the applicant must establish these procedures.

In addition, the commenter recommends that § 23.45(f)(4) be revised to include the establishment of procedures for conducting a missed approach and the requirement for these procedures be stated in the Airplane Flight Manual in accordance with the requirements of §§ 23.1585 and 23.1587. The FAA agrees with the recommendation. Since new §§ 23.67(e)(3) and 23.77(c) contain requirements for the establishment of condition for the execution of a missed approach and balked landing and § 23.45(f)(4) as proposed in Notice No. 83-17 requires the establishment of procedures for the execution of balked landings, the procedures for executing a missing approach should also be included in this amendment of § 23.45(f)(4). These procedures are required to be in the Airplane Flight Manual by § 23.1585(a). The FAA considers this addition as an elaborative, nonsubstantive, nonsubstantive change to § 23.45(f)(4).

One commenter contends that §§ 23.45 through 23.77 should reflect the standards contained in §§ 25.101 through 25.125 for the following reasons: (1) the proposed wording of § 23.55, Accelerate-stop distance, does not incorporate V_{EF} or the time delays for engine failure recognition and reaction by the pilot as required by Part 25, and (2) proposed § 23.57, Takeoff path, would require a 2.0 percent steady state climb gradient. This is an improvement over existing regulations, but the commenter is of the opinion that 2.4 percent should be required, contending this gradient is very important to the level of safety attained. The commenter contends that the level of safety is not the result of tailoring each takeoff for the most critical condition, but of establishing a floor such as the 2.4 percent gradient. A floor gradient covers those anomalies not accounted for by the takeoff equation; e.g., actual runway gradient rather than average, runway outside air temperature, windshear, drag from brakes and other contaminants, engine power degradation, instrument errors, and weight and balance errors. In addition, this commenter states that if the takeoff is predicated upon clearing obstacles by some fixed value; e.g., 35 feet, the end result will be disastrous because these anomalies may contribute to a failure to clear the obstacle.

The FAA does not agree with the comment that §§ 23.45 through 23.77 should be replaced with the requirements of §§ 25.101 through 25.125. The requirements of §§ 23.45 through 23.77 which require a 2-percent second-segment climb gradient are the standards for airplanes recertificated to SFAR No. 41 as supplemented by those requirements necessary to comply with the flight performance standards of ICAO Annex 8, Part III. Those recertificated airplanes have a good safety record and retaining those requirements as well as adopting the enhanced flight performance requirements of ICAO Annex 8, Part III, provide the safety level expected of the new airplane designs permitted by this new category. Furthermore, this final rule includes many of the Part 25 requirements suggested by this commenter.

Another commenter states that the proposed flight requirements for this category of airplane attain the appropriate level of safety of commuter category airplanes. The commenter states that the additional requirements of SFAR No. 41C, which brought airplanes over 12,500 pounds into compliance with ICAO Annex 8, Part III, now appear to be applicable to any 10- to 19-seat airplane, even if under 12,500 pounds. The commenter supports this action.

In response to this comment, to clarify what appears to be a misconception on the part of the commenter, the additional requirements of SFAR No. 41C did not require airplanes of over 12,500 pounds to comply with the requirements of ICAO Annex 8, Part III. The ICAO Annex 8 requirements are applicable only if an applicant desires to comply with them for certification to SFAR 41C; i.e., compliance is not mandatory as implied by the commenter. The commenter correctly understands that the ICAO Annex 8 requirements are applicable to any commuter category airplane, even if under 12,500 pounds. Accordingly, ICAO Annex 8 requirements, as adopted by this amendment, are applicable to any commuter category airplane, even if the seating configuration, excluding pilot seats, is less than ten or the airplane has a maximum weight of less than 12,500 pounds and is to be type certificated in the commuter category.

Proposal 6—The comments received in response to the proposed amendment of § 23.51, were discussed under Proposal 5. Accordingly, § 23.51, is adopted as proposed.

Proposal 7—One commenter agrees with the FAA decision to apply essentially Part 25 standards to takeoff performance criteria for commuter category airplanes. This commenter suggests that a significant simplification of § 23.53, Takeoff speeds, could be achieved if it were based more closely on the existing requirements of § 25.107 and the Joint Airworthiness Requirements (JAR) 25.107. A proposed simplification was offered. (NOTE: The Civil Airworthiness Authorities of certain European countries have agreed common to comprehensive and detailed airworthiness requirements referred to as the Joint Airworthiness Requirements (JAR) with a view to minimizing type certification problems on joint ventures, and also to facilitate the export and import of aviation products.) The FAA agrees and § 23.53(c) has been simplified by deletion of subparagraph (c)(4)(ii) and (iii) which are included in subparagraph (c)(1) of this section.

Another commenter notes the absence of a requirement for the determination of the minimum unstick speed, V_{MU}, and the resultant absence of V_{MU} consideration in the determination of the rotation speed, V_R. A determiniation of V_{MU} was not a requirement for a type certification under SFAR No. 41 and the FAA considers the requirement that V_R not be less than 1.10 V_{S1} or 1.10 V_{MC} as an adequate safeguard. In addition, another commenter supports this FAA position and notes that the V_R requirement is more stringent than that required for transport category airplanes. In addition, the determination of V_{MU} typically requires addition of equipment to the airplane to conduct the tests and the FAA considers the additional tests as unnecessary for commuter category type certification.

Proposal 8—One commenter states that although the proposed requirement of § 23.55, Accelerate-stop distance, have been accurately adopted from Part 135, Appendix A, § 5(c), this section has always conflicted with the definition of V_1 as a decision speed. The commenter suggests that § 23.55(a)(2) be changed to read "...at which V_1 is reached assuming that, in the case of engine failure, the pilot decides to stop at the speed V_1." Another commenter contends that the proposal needs to be modified since it is not entirely consistent with the relationship between V_1 and V_{EF}, as stated in § 23.53(c)(1)(iv). This commenter suggests that the language used in § 23.55(a) emulate the existing requirements of § 25.109(a) and JAR 25.109(a). The FAA agrees with the first commenter regarding the conflict with the definition of V_1 as a decision speed and also with V_1 and V_{EF} as proposed in § 23.53(c)(1)(iv). These apparent conflicts can be resolved by more clearly setting forth the series of events necessary to determine the accelerate-stop distance requirement. Section 23.55(a) is revised accordingly and the revision is a nonsubstantive change to the requirement as proposed.

One commenter suggests § 23.55(b)(3) be changed to read "...no more than average skill is required..." instead of "...exceptional skill is not required..." The commenter does not provide a reason for the suggestion. Section 25.109(b)(3) has the same wording as the proposal in § 23.55(b)(3) and the FAA is not aware of any interpretive problems with the Part 25 requirement. Accordingly, § 23.55(b)(3) is adopted as proposed in Notice No. 83-17.

Proposal 9—Two commenters note that § 23.57 is patterned after the requirements of § 25.111, and that § 23.57(c)(2) includes the "second segment" climb requirement. They contend that this approach to stating the requirements may ultimately cause disputes; therefore, it is more appropriate to include the requirement in § 23.67, Climb: one engine inoperative. The FAA agrees and the words "at a steady gradient of not less than two percent, and" are deleted as proposed in § 23.57(c)(2) and the "first segment" and "second segment" climb requirements are added to § 23.67 as recommended by these commenters.

One commenter contends the takeoff path should terminate at 1,000 feet above the takeoff surface as stated in Part 135, Appendix A, instead of 1,500 feet as proposed in § 23.57(a) and the final rule should delete all en route climb gradient requirements other than a 1.2 percent standard. The FAA does not agree. First, airplanes recertificated to SFAR Nos. 41B and 41C which comply, at the election of the applicant, with the ICAO requirements, the ICAO 1,500-foot takeoff path requirement applies instead of a 1,000-foot takeoff flight path required in Part 135, Appendix A. Furthermore, commuter category airplanes are to comply with the ICAO requirements. Secondly, en route climb gradient requirements other than 1.2 percent were required by an SFAR 41 amendment which set forth the requirements for ICAO compliance. These requirements are necessary in the commuter category standards to comply with the ICAO airworthiness standards.

Another commenter contends the 2-percent climb gradient to 400 feet, as stated in Part 135, Apendix A, paragraph 6(b)(2), has been interpreted to be the same gradient required at airfield altitude. This commenter cites § 25.121(b) which was not referenced in SFAR No. 41B to satisfy compliance with ICAO requirements. The commenter states the same criteria currently contained in Part 135, Appendix A, should be retained for § 23.57(c)(2) and further contends that no reason is evident for changing that regulation. The FAA does not agree. The proposed climb gradient adopted in § 23.67 more clearly identifes the requirement for climb with one engine inoperative. The climb gradient is necessary to comply with the ICAO requirements and the level of safety expected on new airplane designs of the commuter category.

Another commenter contends that applications for type certification in the commuter category, for airplanes with more than two engines, are likely to be rare and some simplification of § 23.57 and other requirements might be achieved by the deletion of requirements relating to three- and four-engine airplanes. The FAA concludes, however, that in cases where an applicant is designing a three- or four-engine airplane, the applicant should know the applicable requirements for its design. Therefore, the requirements for three- and four-engine airplanes should remain in the final rule. Accordingly, the proposal regarding three- and four-engine airplanes is adopted as proposed.

One commenter understands that FAA policy, with respect to transport category airplanes, is to deny performance credit for manual propeller feathering before the airplane reaches a height of 400 feet above the takeoff surface and suggests that § 23.57(c)(4) be changed to include the commenter's understanding of this policy as a clarification of the use of propeller feathering in determining commuter category airplane performance. The commenter's understanding is correct. Furthermore, the FAA used Part 135, Appendix A, paragraph 6(b), Takeoff climb: one-engine-inoperative, as one of the reference sources for the § 23.57(c)(4) proposal. Paragraph 6(b) states, in part, ". . .the remaining engines at the maximum takeoff power or thrust, and the propeller of the inoperative engine windmilling with the propeller controls in the normal position, except that if an approved automatic feathering system is installed, the propellers may be in the feathered position:. . ." To clarify the condition for which use of propeller feathering can be regarded as a configuration change, the word "automatic" will procede the word "propeller" in the final revision of § 23.57(c)(4). This action is not based upon the policy applied to transport category airplanes, but rather upon the requirement stated in the additional airworthiness standards of Part 135, Appendix A, which was to be integrated into Part 23 for commuter category airplanes as indicated in Notice No. 83-17.

Proposal 10—One commenter states that this new § 23.59 should be applicable for ICAO Annex 8 compliance and should apply only when the applicant elects such compliance. the FAA disagrees. The issue of ICAO Annex 8 compliance has been discussed previously as it concerns the level of safety expected of new airplane designs for the commuter category.

Another commenter supports the proposal but, nonetheless, suggests a change based upon material contained in Advisory Circular, Joint (ACJ) No. 25.113(a)(2) for takeoff with all engines operating. (NOTE: AJC advisory material is developed in conjunction with the JAR airworthiness standards.) The commenter contends that requirements of takeoff and accelerate-stop performance data are incomplete unless they include sufficient information to allow the rational downward adjustment of V_1 when taking off from a wet runway. The FAA does not agree. The requirements, as stated, are essentially equal to those applied to transport category airplanes as cited in § 25.113(a). The FAA is not aware of any significant problems in applying the requirements of that section nor of any unsafe conditions arising from application of its requirements either to transport category airplanes or to the SFAR No. 41 airplanes which comply with the ICAO requirements.

One commenter, while stating that § 23.59(b) is a desirable addition, contends a new speed, V_{LOF}, is introduced. In addition, the commenter suggests the V_R should be substituted for V_{LOF} since this would result in a more conservative, shorter takeoff run. The FAA does not agree that a new speed, V_{LOF}, has been introduced. Section 23.51(b) currently states "For multiengine airplanes, the lift-off speed, V_{LOF}, may not be less than V_{MC} determined in accordance with § 23.149." In addition, the FAA does not agree that V_R should be substituted for V_{LOF} because V_R is the rotation speed for takeoff and V_{LOF} is the speed at which the airplane leaves the takeoff surface after attaining the rotation speed, V_R.

Another commenter contends that few airport authorities declare clearways and that few operators have the resources to carry out independent surveys. Operators should be permitted to use defined clearways when available and permitted by the operating rules. Takeoff distance limitations would result in a unwarranted penalty at airports where clearways have been defined by the responsible authorities. Accordingly, the FAA is adopting the requirements as proposed.

Proposal 11—One commenter states that the new § 23.61, only applies to ICAO Annex 8 compliance and should apply only when the applicant elects such compliance. The FAA disagrees. The issue of complying with the requirements of ICAO Annex 8 has been previously discussed.

Another commenter recommends deleting the requirements applicable to three- and four-engine airplanes. The FAA disagrees. See the discussion in Proposal 9.

Proposal 12—One commenter contends that the proposed change to § 23.65 concerns all-engine climb and, except for balked landing climb, Part 135, Appendix A, is not concerned with all engine climb. Accordingly, the commenter recommends the deletion of proposed paragraph (d) to § 23.65. This commenter contends that the source referenced for the proposal is in error. Another commenter contends that the proposed additional paragraph (d) is superfluous because: (1) a requirement to furnish performance data in the Airplane Flight Manual is contained in § 23.1587, Performance information; (2) proposed new paragraph (a) to § 23.45, General, requires all performance requirements to be met at ambient atmospheric conditions; and (3) the existing § 23.21(a) requires all flight requirements to be met "at each appropriate combination of weight and center of gravity. . .for which certification is requested." The FAA has reexamined the proposal, considered the comments made, and does not agree with the commenters' contentions. The requirement states that the performance data must be determined. The information requirement by § 23.1587 cannot be furnished until it is determined as required by § 23.65(d).

Proposal 13—One commenter states that proposed § 23.67(e) requires unwarranted reliance on the takeoff path requirements of proposed § 23.57 for one-engine-inoperative climb requirements. This commenter contends that the proposed regulation can be interpreted as meaning either that the takeoff with the landing gear extended requirement of Part 135, Appendix A, paragraph 6(b)(1) has either disappeared or may be demonstrated in ground effect and that neither case is considered satisfactory. This commenter recommends § 23.67(e) should be rewritten in a manner that follows the pattern of Part 135, Appendix A, paragraph 6(b) in order to be more easily understood.

Additionally, another commenter states that the proposed § 23.67(e)(2) seems to be redundant with proposed § 23.57(c)(3)(i) for two-engine airplanes and less restrictive than proposed § 23.57(c)(3)(iii) for three- and four-engine airplanes; therefore, proposed § 23.67(e)(2) might be deleted.

One further commenter states that no reason has been offered for failing to include the takeoff climb, landing gear extended, requirement of Part 135, Appendix A, in this rule and contends that § 25.121(a) and JAR 25.121(a) have always had such a requirement. This commenter asserts that § 23.57(c)(1) is not an adequate substitute because the takeoff climb with the landing gear extended should form a part of the takeoff weight, altitude, temperature (WAT) limitation and the "second segment" climb should also be included in § 23.67 instead of § 23.57. This commenter also states that, as discussed in the comment to § 23.57, the "second segment" takeoff climb with the landing gear retracted should also be located in § 23.67 since this, too, forms a part of the takeoff WAT limitation. In addition, this commenter states that by referencing § 25.1533(a)(1), it is clear by analogy with § 25.121(c), that proposed § 23.67(e)(2) forms the third component of the takeoff WAT limitation. This commenter submitted a rewrite of § 23.67(e) for consideration.

The FAA thoroughly considered the comments received along with the requirements of proposed § 23.67(e). The FAA agrees that the requirements should be rewritten to be more easily understood. The removal of the requirements for one-engine-inoperative climb in the takeoff from proposed § 23.57 and the insertion of that requirement in § 23.67 will meet this objective.

One commenter contends that a need exists for a further requirement similar to § 25.1533(a)(1) and JAR 25.1533(a)(1), which calls for a performance operating limitationn to be established; i.e., the maximum takeoff weight as a function of altitude and temperature, at which compliance can be shown with the minimal climb gradient of proposed § 23.67(e). The FAA considers that the further requirement is encompassed adequately within the proposed requirements of § 23.1583(c)(3)(iii). This commenter contends that accepting a lower standard for the "second segment" climb is difficult to defend and also asks why there is no increase in values for three- and four-engine airplanes. The FAA considers the "second segment," 2-percent climb gradient for two-engine airplanes as the minimum standard based upon the satisfactory service experience with two-engine airplanes recertificated to SFAR No. 41. The FAA, however, reviewed this comment and agrees that a minimum standard should be established for three- and four-engine airplanes. Accordingly, in order to clarify this section and make it consistant with other proposed sections in this rulemaking action, § 23.67(e)(1)(ii) must include appropriate climb gradients for three- and four-engine airplanes. Also, corrections have been made to §§ 23.67(e)(1)(i) and 23.67(e)(2) by including appropriate three- and four-engine provisions.

One commenter contends that a need exists for a knowledge of the airplane's net climb/descent gradient with one engine inoperative in order to establish compliance with the performance operating rules relating to en route flight proposed by the commenter. The commenter asserts that this need is not met by existing § 23.67 and a proposed wording for a new section is offered. The FAA does not agree. The proposed requirements meet the en route performance operating rules of Part 135. Accordingly, the proposed section from this commenter has not been adopted.

Comments which are subsequently discussed on Proposal 15 notes that the proposed requirements for approach landing climb were misplaced under § 23.77. As discussed under that proposal, the approach landing climb requirements proposed for § 23.77 have been relocated to § 23.67(e)(3).

Proposal 14—One commenter contends that the requirements of § 23.75, even as amended by proposed new paragraph (g), are inadequate in that they fail to address landing with one engine inoperative. As in the case of evaluation of takeoff performance, a clearer presentation of the relevant requirements can be achieved if the speeds and distances are considered in separate sections. As suggested text for a new requirement of reference approach speeds in offered. This commenter proposes that the landing field length requirement proposed by that, inasmuch as it includes consideration of the all-engines-operating and the one-engine-inoperative cases, is more complex than that proposed in Notice No. 83-17. The commenter notes that higher ambient temperatures dictate greater landing distances and the effect is amplified if credit for reverse thrust is allowed in accordance with existing § 23.75(f). The FAA does not agree that the proposed requirements are inadequate or that there is a need to separate the landing speeds and determination of landing distances into separate sections. The requirements, as proposed, are essentially the same as those applied to transport category airplanes for Part 25 type certification. The comment addressing ambient temperature as one parameter against which landing distances should be determined is well taken. However, § 23.1583, Operating limitations, as proposed, requires as a limitation, the maximum landing weight for each altitude, ambient temperature, and required landing runway length within the range selected by the applicant. Section 23.75 is designed for test purposes and the affect of ambient temperature on the landing distance is calculated in accordance with § 23.1583. Therefore, no change is being made to the proposed requirement.

One commenter contends that consideration of wind in § 23.75(g)(1) is superfluous and should be deleted because of wind consideration in § 23.75(g)(3). Wind condition analysis is set forth in

§ 23.75(g)(3), as proposed. The requirement that wind conditions must be considered is set forth in § 23.75(g)(1). These paragraphs perform different functions, therefore, the word "wind" in § 23.75(g)(1) is not considered superfluous. Section 23.75(g)(1) is adopted as proposed.

Proposal 15—One commenter states that in order to maintain the Part 25 and JAR 25 format, the balked landing climb requirements, for all categories of airplane should be transferred to § 23.65, Climb: All engines operating. The FAA does not agree. This commenter contends that the balked landing climb gradient minimum for commuter category airplanes should not be greater than the 3.2 percent climb gradient required for transport category airplanes. No supporting information was given concerning the inappropriateness of the balked landing climb gradient and that portion of the proposal is, therefore, adopted as proposed.

The comment is made that the minimum speed of 1.10 V_{S1} is considered grossly inadequate since it implies an unacceptable erosion of stall speed margin and/or a need for a significant acceleration if the flaps are retracted from the landing position early in the maneuver. The contention, however, is that a climb initiated at precisely the landing approach speed has the characteristic of being slightly conservative, since climb performance is likely to improve slightly should the speed fall below V_{REF} (reference speed) in an operational maneuver. This commenter offers a rewrite of the proposal. The FAA does not agree that the 1.10 V_{S1} speed is inadequate as the minimum for this balked landing climb speed. Similar requirements have been applied to airplanes certificated under SFAR No. 41, and these airplanes have safely operated under the current rules.

One commenter contends that the proposal has two problems: (1) the proposal addresses the approach climb and is misplaced under § 23.77. Balked landing, which has a very exact meaning; and (2) the requirement should apply only to ICAO Annex 8 compliance and should be deleted or made optional. The commenter states that the approach climb requirement applies with the landing gear retracted and flaps in the approach position and the proposal should be clear that the landing gear is in the retracted position. Another commenter notes this and also suggests that § 23.67 Climb: one engine inoperative, includes the requirement for approach landing climb instead of the section concerned with the balked landing requirements. The FAA agrees that the approach-landing climb more appropriately should be cited as a one-engine-inoperative climb requirement and is being placed in § 23.67(e)(3) for those requirements. As indicated previously, the FAA does not agree that the approach landing climb requirement should be deleted or optional. Accordingly, the requirement for approach landing climb is placed in amended § 23.67 instead of § 23.77 in substantially the same form as proposed in Notice No. 83–17.

Another commenter states that proposed § 23.77(c)(2), although adopted substantially unchanged from § 25.121(d) and JAR 25, is an unsatisfactory requirement primarily due to the operationally unrealistic speed at which the climb gradient minimum may be met. The commenter proposes an existing ICAO Airworthiness Technical Manual standard which possibly avoids this and other purported shortcomings of § 25.121(d) and JAR 25.121(d). The contention is that the proposal has the merit of ensuring compatibility, down to decision heights of 200 feet, with the ICAO PANS/OPS 1:40 go-around obstacle profile and offers greater flexibility in terms of configuration changes. Therefore, the proposal is not necessarily any more stringent than § 25.121(d) or JAR 25.121(d). While the proposal of the commenter appears to have merit, it introduces several requirements which need further consideration. The requirements of § 23.77(c)(2) as proposed in Notice No. 83–17 have been applied in numerous type certification programs and no adverse experience with such application has been offered. Accordingly, the proposed requirements of § 23.77(c)(2) are adopted in § 23.67, Climb: one engine inoperative, as recommended by the commenters.

Two comments were received on the issue of minimum control speed on the ground, V_{MCG}. One commenter questions the lack of a requirement to determin V_{MCG}. Another commenter states that to provide an adequate constraint on the lowest value of V_{EF} with which V_1 may be associated, the inclusion in § 23.149 of a definition of the minimum control speed on the ground is necessary. A text based upon § 25.149(e) was proposed by this commenter. The FAA recognizes the merit in the suggestion; however, based upon experience with recertification of airplanes to the requirements of SFAR No. 41, a requirement for determining the minimum control speed on the ground, V_{MCG}, is not necessary at this time.

One commenter contends an adequate definition of the reference landing approach speed with one engine inoperative depends on the definition of the minimum control speed during landing approach with one engine inoperative, V_{MCL-1}. The contention is the minimum control speed with one engine inoperative is needed to maintain adequate lateral and directional control in the event of a one-engine-inoperative approach being discontinued. A text based upon JAR 25.149(g) is offered by this commenter. The FAA does not agree because the requirements of § 23.67 which relate to approach landing climb must be met for type certification. The FAA is not aware of any adverse experience because of the lack of such a determination, nor was any data submitted to support the contention. Furthermore, such a requirement has not been required for recertification of airplanes to SFAR No. 41.

One commenter states that the required rates of roll of § 23.157, at takeoff and during the approach, which result from the application of the formula contained in paragraphs (a) and (c) are not disputed. With the increase from 12,500 pounds to 19,000 pounds for the maximum takeoff weight of commuter category, however, these formulas yield rates of roll somewhat lower than designers would wish to achieve or pilots perceive as adequate and are lower than what is considered acceptable in ACJ 25.147(c)(2) and ACJ 25.147(e) for transport category airplanes. This commenter contends that this problem can readily be resolved by a proposed language change to § 23.157(a) and (c). The FAA does not agree that § 23.157 should be revised. The requirements of § 23.157 are the minimum rates of roll and designers may increase the rates of roll for their airplanes if they choose. Therefore, § 23.157 is an adequate minimum standard for commuter category airplanes and no change is being made to the existing requirement.

Proposal 16—One commenter contends that the proposal appears to provide a lower standard for commuter category airplanes that is applied to normal category airplanes and that the current requirements of § 23.161(c)(2) appear adequate. Another commenter states that since most commuter category airplane operations would be conducted under instrument flight rules (IFR), reducing control forces to zero (trimmed flight) under most flight conditions is important. This commenter contends that requiring the airplane to be in trim, laterally and directionally, at only one speed is adequate. A proposed text for § 23.161(b)(2) is offered by this commenter. The commenter also suggested that the requirements of § 25.161(d) be added to the rule. In addition, this commenter states that with the current advances in the design of commuter category airplanes, an out-of-trim requirement, similar to § 25.255 should be included in Subpart B-Flight. Another commenter notes that the proposal is unclear in that it appears to allow a 10-pound, out-of-trim force under the 3-degree approach requirement for commuter category airplanes. The FAA has reexamined the proposal and considered each of the comments received addressing the proposed changes to § 23.161. The FAA agrees with the comment that the current requirement of § 23.161(c)(2) is an adequate minimum standard and consequently withdraws the proposed change for § 23.161(c)(2). The FAA does not agree that, as a minimum airworthiness standard, commuter category airplanes should be required to be in trim laterally and directionally at speeds other than that stated in § 23.161(b), as proposed. The FAA is not aware of any adverse experience concerning the lack of requirements at other speeds for the commuter category size airplanes. With the exception of lateral trim, the FAA considers the current requirement of § 23.161(d) substantially equivalent to § 25.161(d) and no adverse experience has been shown because of the lack of a lateral trim requirement in § 23.161(d). The FAA does not agree that a requirement is needed similar to § 25.255, Out-of-trim characteristics, for commuter category airplanes. The background indicates the requirement was promulgated because of more rapid fuel burnoff with rapid center of gravity shifts in transport airplanes, and due to new designs for handling aerodynamic balance by fuel transfer for normal operations. The FAA is not aware of any adverse service experience because of the lack of such a requirement for airplanes limited to a size approaching that of the new propeller-driven commuter category. The FAA concludes, therefore, a requirement similar to the out-of-trim requirement in § 25.255 is unnecessary.

Proposal 17—No comments were received pertaining to the proposed amendment of § 23.173, Static longitudinal stability. Accordingly, the requirement is adopted as proposed.

Proposal 18—One commenter contends that proposed § 23.175(b)(1)(i) is incorrect and current § 23.175 language more accurately describes the section intent and should read as follows: "The speed need not be less than $1.4V_{S1}$ for commuter category airplanes, or $1.3V_{S1}$ for other categories."

Another commenter states that since § 23.1583(a)(3)(iii) requires speed limits for commuter category airplanes to be in terms of VMO/MMO the existing § 23.175(b)(1)(i) does not need to be changed since the speeds are covered adequately by existing § 23.175(b)(1)(iii). This commenter states that since § 23.21(a) requires all "flight" requirements to be met "at each appropriate combination of weight and center of gravity within the range of loading conditions for which certification is requested," the proposal to evaluate the cruise static longitudinal stability of commuter category airplanes at the maximum takeoff weight is redundant and unnecessary. In addition, this commenter states that the requirement for static longitudinal stability in the cruise configuration of Part 135, Appendix A, paragraph 9(b) has in the past been viewed as a replacement for the high-speed and low-speed cruise static longitudinal demonstrations of § 23.175(b). Since only minor changes to § 23.175(b) have been proposed, an explanation and clarification is needed. The FAA has reexamined the proposal, the requirements of Part 135, Appendix A, § 9(b) (which is the cited source for the proposal), and the comments received. The proposal needs to be revised to more clearly express the requirements set forth in the cited source. Accordingly, § 23.175(b) is revised and adopted to achieve this clarification of the high speed cruise requirement for commuter category airplanes.

Proposal 19—No comments were received to the proposal. Accordingly, § 23.333 is amended as proposed.

Proposal 20—No comments were received to the proposal. Accordingly, § 23.335 is amended as proposed.

Proposal 21—No comments were received to the proposal. Accordingly, § 23.337 is amended as proposed.

Proposal 22—No comments were received to the proposal. Accordingly, § 23.349 is amended as proposed.

Comment to § 23.397. For commuter category airplanes, one commenter contends that the Footnote 1 to the table of forces in § 23.397 should be changed to read as follows: ". . . the specified maximum values must be increased linearly with weight to 1.35 times the specified values at a design weight of 19,000 pounds." This commenter suggests a review of CAR 3.212 for the intent of the footnote. Upon review of CAR 3.212 and earlier requirements, the FAA finds that it was included prior to establishment of a 12,500 pound weight limit for small airplanes and called for the provided maximum control forces at 5,000 pounds to be increased linearly with weight by a factor of 1.0 at 5,000 pounds to a factor of 1.5 at 25,000 pounds. This footnote continued to read the same in CAR 3 after the adoption of the 12,500 weight limitation by Amendment 3-10, effective May 16, 1953. When CAR 3 was recodified into Part 23, this note was revised to call for the maximum forces to be linearly increased with weight to 1.18 times the specified values at a design weight of 12,500 pounds which is the factor that would have been obtained from the linear increase called for in the CAR 3 footnote.

The review of CAR 3.212 has shown that the recommended changes would only identify and continue provisions which have been required for airplanes of this size under previous airworthiness standards. Since this recommended change is consistent with previously applied airworthiness standards and will be clarifying by providing the value of the linearly increased factor at the new maximum design weight of 19,000 pounds, the FAA agrees with the contention of this commenter. Footnote 1 to § 23.397 is amended to the extent that the linear increase must be to 1.35 times the specified values at the maximum permissible weight of 19,000 pounds for the commuter category airplane.

Proposal 23—No comments were received to the proposal. Accordingly, § 23.443 is amended as proposed.

Comment to § 23.561. For commuter category airplanes, one commenter notes that no proposal has been made to strengthen the maximum load factors of § 23.561 associated with emergency landing conditions. This commenter contends that the ultimate inertia forces contained in § 23.561 are far below the level the human body is capable of withstanding. The commenter cites the National Transportation Safety Board (NTSB) 1981 report entitled "Cabin Safety in Transport Category Aircraft" as the source for this information. In response to this comment, the purpose of the proposal was not to reevaluate the maximum load factors associated with emergency landing conditions for all airplanes to be type certificated pursuant to Part 23 at this time. The FAA is considering a revision to the requirements of § 23.561 within the framework of the Part 23 Airworthiness Review. The comment is beyond the scope of Notice No. 83-17 and cannot be acted on as a part of this rulemaking.

Proposal 24—One commenter's opinion is that the structural cornerstone of the safety objectives for transport category airplanes is the requirement that structure should be designed to be damage tolerant unless it can be demonstrated, for particular structural features, that this is impractical. In the latter case, according to the commenter, a safe life evaluation must be made using appropriate scatter factors, and, in practice, this has meant that each primary structure, apart from the landing gear, is required to be damage tolerant, Consequently, catastrophic failures due to fatigue, corrosion, or accidental damage would be avoided. The commenter contends that the NPRM, as presented, allows but does not encourage the adoption of the damage tolerance approach to long-term structural integrity. The comment is made that while the safe-life approach is still valid for the majority of airplanes presented for certification under Part 23 which, because of their low utilization, will never approach their theoretical life limits or which can draw upon a long history of satisfactory service experience on similar designs, the safe-life concept is inappropriate for new commuter category airplanes which will be subjected to a more intensive utilization which equals or exceeds the usage attained by larger transport airplanes. The commenter states that the additional protection against catastrophic structural failure due to corrosion, stress corrosion, accidental damage, or discrete source damage which can accure from a damage tolerant design policy will bring those safety benefits necessary to meet the FAA safety objectives for this type of airplane. The FAA recognizes the merit of a damage tolerant design; however, the service experience with airplanes recertificated to SFAR No. 41 with their corresponding high utilization does not support the need for a mandatory damage tolerant design philosophy for commuter category airplanes.

Proposal 25—No comments were received to the proposal. Accordingly, § 23.677 is amended as proposed.

Proposal 26—No comments were received to the proposal. Accordingly, § 23.721 is amended as proposed.

Proposal 27—No comments were received to the proposal. Accordingly, § 23.783 is amended as proposed.

Comment to § 23.785. Section 23.785, Seats, berths, safety belts, and harnesses. One commenter contends that the problem of inadequate seat strength is well known, and this is an opportunity to bring the requirements closer to reality. The FAA is aware of the possibility that seat-strength requirements in certain areas should be enhanced and it is engaged in research aimed at proposing realistic and attainable dynamic criteria for all seats in small airplanes. To propose requirements before this research is completed, or has at least progressed to the point that realistic criteria are available for application in type certification programs would be premature.

When Notice 83-17 was issued proposing the addition of a commuter category airplane to Part 23, the applicable amendment of Part 23 at that time required the installation of a seat belt and shoulder harness for the front two seats and seat belts for all additional seats. Subsequent to the issuance of Notice No. 83-17, the FAA, in response to a petition for rulemaking, proposed the mandatory installation of shoulder harnesses at all seats in normal, utility, and acrobatic category airplanes with a passenger seating configuration, excluding pilot seats, of nine or less. Amendment 23-32 (50 FR 46872, November 13, 1985) adopted the proposals substantially as set forth in Notice No. 85-11 and because final action had not occurred on the commuter category airplane proposals, the above identified occupant restraint requirements applicable at the time the commuter category airplane was proposed were removed from § 23.785(g) and replaced by those requirements in Amendment No. 23-32. Since these later adopted requirements do not address the commuter category airplane, the deleted occupant restraint requirements are being reinstated for commuter category airplanes in § 23.785(g)(2) and the requirements adopted by Amendment No. 23-32 applicable to normal, utility, and acrobatic category airplanes are designated in § 23.785(g)(1).

The FAA is considering additional cabin safety and occupant protection requirements for the commuter category airplane and will initiate appropriate rulemaking action to address this issue after a thorough study of the need and substance of such additional requirements identified from the study.

Proposal 28—One commenter states that the proposed § 23.787(g)(2) should read, ". . . in paragraphs (a), (b), and (f) of this section." The FAA agrees with the comment and the addition of paragraph (f) clarifies that the requirement applies to baggage compartments as well as cargo compartments in commuter category airplanes since Part 23 does not distinguish between cargo and baggage compartments.

Another commenter contends that the cargo compartment regulations are insufficient in that most designs have only a porous bulkhead aft and closed inaccessible areas forward. The commenter states that no design for fire retardation of fire extinguishing in these compartments exists and the requirement should incorporate the standards of § § 25.855 and 25.857. In support of this comment, the commenter states that in the last 3 years alone, one commuter air carrier had four incidents of smoke/fire in unprotected cargo compartments in SFAR No. 41 airplanes. These incidents were caused by various devices shipped by passengers. The contention is that there was no way the crew could have reached a compartment to extinguish a fire if it had occurred. The FAA does not agree that the standards of § § 25.855 and 25.857 should be adopted for commuter category airplanes. Amendment 23-14, effective December 20, 1973, requires that cargo compartments in all Part 23 airplanes be constructed of materials which are at least flame resistant. Not all cargo compartments in Part 25 airplanes are required to have fire extinguishing provisions, specifically Class D cargo compartments. The FAA considers the requirements as proposed in Notice 83-17 for cargo compartments in commuter category airplanes sufficient. Therefore, the additional requirements applicable to commuter category airplanes are adopted as proposed.

Proposal 29—One commenter states that § 23.807(d)(1)(i), as proposed, should read, "For a total seating capacity of 12 to 15, an . . . ." This commenter contends that SFAR No. 41, as originally written, overlooked the possibility of airplanes with 11 or fewer seats. The FAA does not agree since normal, utility, and acrobatic category airplanes with a seating configuration, excluding pilot seats, of nine or less with exceptions for airplanes with centerline or fuselage-mounted engines, must have an emergency exit on the opposite side from the main door as specified in § 23.783. The FAA considers that the minimum acceptable number of emergency exits for commuter category airplanes are those proposed for a total seating configuration of 15 or less to assure adequate egress in an emergency situation by a substantiating emergency evacuation test.

Another commenter contends that the proposed regulations are insufficient and should conform to § 25.807, to § 25.809(a) and most importantly to § 25.809(b). While these exits must be openable from the inside and the outside, the contention is that common sense and experience dictate that rescue personnel should be able to locate and open these exits from the outside. In addition, this commenter states that the exits should be marked as in § 25.811 and, specifically, must be marked on the outside in accordance with § 25.811(f) and (g). The FAA recognizes some merit in the contentions of this commenter; however, the FAA considers the proposed requirements to be sufficient and points out that § 23.783(c), as adopted, requires each external door to be openable from the outside. The issues raised by this commenter need further study before the FAA issues further regulations. These issues are being considered in the Part 23 Airworthiness Review Program. In addition, the FAA has issued Advisory Circular (AC) 23.807-3, dated January 20, 1984, Subject: "Emergency Exits Openable From Outside for Small Airplanes," on the subject of marking exits openable from the outside, and the Advisory Circular responds to NTSB Safety Recommendation A-82-94. The FAA is not aware of service problems with airplanes recertificated to SFAR No. 41 that would support adoption of the Part 25 requirements.

Proposal 30—One commenter suggests that, for consistency with Part 25, the proposed § 23.809 be presented under § 23.803. Also, to ensure reliable results from the evacuation demonstration, the criteria of § 25.803(c), which is not presented in the proposal, should be incorporated or published as advisory material. The FAA finds merit in the section consistency suggestion and the section is renumbered accordingly. In response to this commenter's suggestion with regard to § 25.803(c), reference should be made to the guidance material of Advisory Circular No. 20-118, "Emergency Evaluation Demonstration From Small Airplanes," dated July 12, 1983. The Advisory Circular sets forth acceptable means, but not the only means, of showing compliance with required emergency evacuation demonstrations from small airplanes. The FAA considers it a satisfactory method of compliance with the regulation as adopted in this final rule.

Proposal 31—One commenter contends that the proposed requirement is not consistent with "real world" problems. The assertion is that present designs do not allow for the safe and reasonable carriage of handicapped persons on board and the 9- to 15-inch minimums for aisle widths, as called for by this NPRM, are not wide enough to accommodate the standard lift chair used to bring nonambulatory persons aboard. At present, handicapped persons usually have to be placed by the cabin door and, in case of an emergency, could block rapid evacuation. This commenter states that a standard width of 21 inches should be the minimum allowed for any airplane which seats more than 10 passengers and notes that narrow aisles also restrict the entrance and exit of passengers, especially if they are older. The FAA appreciates the concern expressed by this commenter for handicapped persons; however, the service experience with current airplanes meeting the minimum standards of aisle width do not support the need for a change as proposed by this commenter. Another commenter states that the Notice proposes to narrow the minimum aisle width by one-fourth of that required for 10- to 19-seat airplanes in Part 25. This commenter contends that minimum aisle width is an important safety feature if evacuation becomes necessary and that Part 25 standards should be retained. The FAA does not agree that for the new commuter category of airplane the minimum aisle width needs to be the same as set forth for the transport category airplane. The minimum aisle width proposed in the Notice No. 83-17 was the same as that used for the recertification of SFAR No. 41 airplanes. The FAA is not aware of any service-related problems with airplanes so recertificated which indicate the minimum width of the aisle is not adequate. Therefore, the minimum width for the main aisle is adopted as proposed.

Proposal 32—One commenter notes that the word "probably" in the second sentence of § 23.831(b) as proposed should read "probable." The FAA agrees and the spelling is corrected.

Another commenter states that the expression "harmful or hazardous concentration of gases and vapors" need to be defined and criteria specified. The FAA does not agree that further definition is needed in the regulations. The maximum concentration of carbon monoxide permissible has been stated in § 23.831(a). The requirement is stated in objective terms to convey the purpose of the rule. In addition, the requirement has been applied in the SFAR No. 41 recertification of airplanes and also in the certification of transport category airplanes without any known adverse experience. The amendment is adopted as proposed.

Proposal 33—No comments were received to the proposal to add a new § 23.851. Accordingly, the requirement is adopted as proposed.

Proposal 34—One commenter contends that the proposal does not succeed in accurately incorporating the interior materials burn test requirements of § 25.853. The most serious is the omission of the 12-second vertical burn test of § 25.853(b) required by its reference to Part 25, Appendix F, paragraph (d). The FAA agrees with the commenter. The requirements, as stated, would require a vertical test with the flame applied for 60 seconds, whereas § 25.853(b) requires an application period of 12 seconds. The time period for application of the flame to materials of § 23.853(d)(3)(ii), therefore, is reduced from 60 seconds to 12 seconds. This commenter notes that in § 23.853(d)(1) the word "towel" should be plural and the word "probably" in the second sentence should read "probable." The FAA agrees and these changes are made in the final rule. This commenter suggests that the phrase "or other equivalent methods" be changed to read "or other approved equivalent methods" in order to conform to the reading of Part 25. The FAA agrees and has incorporated the phrase "or other approved equivalent methods" in § 23.853(d)(3)(ii), as suggested.

One commenter states that the address in § 23.853 (d)(3)(iii) for the American National Standards Institute should be 413 Broadway, New York, New York 20018. In addition, the commenter contends that the motion picture film safety requirements is not needed for commuter category airplanes and should be deleted. Inquiry was made to the American National Standards Institute, and the address stated in Notice No. 83-17 is correct as of this date. The motion picture film safety requirement may not be needed for a particular commuter category airplane design. The requirement is retained, therefore, to assure that the minimum standards are met when motion picture film is used on commuter category airplanes.

Another commenter agrees with the revisions to § 23.853 where major portions of Part 25 were incorporated. This commenter, and two additional commenters, recommend that § 23.853 incorporate the requirements proposed in Notice No. 83-14 (48 FR 46250; October 11, 1983) on the subject of flammability requirements for aircraft seat cushions for commuter category airplanes and make changes to Part 135 similar to the changes made to Part 121 in Notice No. 83-14. The contention is that this improvement is even more critical for the commuter category since, most likely, a flight attendant will not be available to take initial emergency action to extinguish a fire. Furthermore, post crash fires pose a serious problem for commuter airplanes and no logical reason appears as to why new designs should not incorporate this life-saving technological improvement.

The FAA appreciates the concerns expressed by the commenters on the issue of requiring seat cushions in commuter category airplanes to meet the test criteria proposed in Notice No. 83-14. The FAA recognizes the merit of the comments. Further study is required, however, with respect to commuter category airplanes and operations conducted in accordance with Part 135. These issues will be considered in the Part 23 Airworthiness Review.

Proposal 35—One commenter contends that § 23.901(b)(3) appears to be redundant as the installation will have to meet the conditions identified in the installation manual required by § 33.5. The FAA notes that § 33.5 does not specifically address vibration characteristics which are a significant consideration in the installation of turbopropeller engines in commuter category airplanes and the requirement has been applicable to airplanes certificated to the additional airworthiness standards of Part 135, Appendix A, since 1970. Therefore, the requirement is adopted as proposed.

Proposal 36—One commenter contends that § 23.903(e)(2) should be revised to read: "Means must be provided for stopping combustion and rotation of any engine in flight except that engine rotation need not be stopped if continued rotation could not jeopardize the safety of the airplane." This commenter states that this conforms to the Part 25 requirement and provides a needed clarification, and the last part of proposed subparagraph (e)(2) should be deleted because it already appears in subparagraph (d)(2)(iii) of this section. The FAA does not agree that § 23.903(e)(2) should be revised as suggested. First, the proposed requirement of Notice No. 83-17 with respect to stopping combustion and rotation has been required for turbine engines in all Part 23 airplanes since the adoption of Amendment 23-14, effective December 20, 1973, and no reason is offered by the commenter to support the suggested change. Secondly, the last part of proposed § 23.903(e)(2) concerns the requirements for restarting the engine while § 23.903(d)(2)(ii) concerns requirements for stopping the engine. Another commenter contends that the proposal is insufficient and should reflect the provisions of § 25.903, especially paragraph (d)(1). This commenter states that most commuter/turboprop operators have reported one or more rotor failures per year with the resultant disintegrating residue piercing the fuselage at the pilot's or passenger's compartments. Another commenter states essentially the same concern. The FAA concurs, in part, with these comments. Part 23, however, was revised by Amendment 23-29, effective March 26, 1984 (49 FR 6847; February 23, 1984) and adequately addresses the issue of rotor failure in § 23.903(b)(1). One commenter states that the proposed revision to § 23.903(e)(2) is not in accordance with the referenced sources because neither Part 135, Appendix A, paragraph 38(a)(2) nor § 25.903(c) require a means for stopping the rotation of a turbine engine. This commenter contends that such a feature is required only where continued rotation could jeopardize the safety of the airplane and states that the requirement to stop rotation is both restrictive and unnecessary. The commenter suggests that § 25.903(c) replace proposed § 23.903(e)(2). The FAA agrees with the commenter that the requirement for stopping combustion and rotation of the turbine engine is not in the reference sources of Part 135, Appendix A or in § 25.903(c). The requirement is required by the current version of § 23.903(e)(2). The commenter offers no data or information to support a change from the present requirement. Accordingly, the requirements are adopted as proposed.

Another commenter notes that systems within a fire zone that are required to be functional after the outbreak of a fire need to be merely "fire-resistant" and perceives an inconsistency between the "fireproof" and "fire-resistant" definitions of Part 1. This commenter contends that for fire-extinguishing systems to be effective and for continued safe flight, the engine must be stopped and the propeller feathered. That commenter suggests that the requirement should be updated to "fireproof." The FAA does not agree. Part 1 defines "fire resistant," in part, as ". . . the capacity to perform their intended functions under the heat and other conditions likely to occur when there is a fire at the place concerned." Accordingly, the proposal is adopted as stated in Notice No. 83-17.

Proposal 37—No adverse comments were received to the proposal. Accordingly, the requirements are adopted as proposed.

Proposal 38—One commenter contends that the proposed requirement is insufficient and should incorporate all of § 23.963. Additionally, the commenter states that most designs cannot comply with paragraphs (c) and (f) of § 23.963. The FAA does not agree that the requirements are insufficient or that most designs cannot comply with the standards. A review of the provisions of Part 23, together with § 23.963(f), and § 25.963 shows that the wording of § 23.963(a) and (c) are substantially identical to the wording of § 25.963(a) and (c), respectively. Paragraph (c) of § 23.963 and § 25.963 sets forth requirements for flexible fuel tank liners; i.e., § 23.963(c) requires each flexible fuel tank liner be of an acceptable kind while § 25.963(c) requires flexible fuel tank liners be approved or shown to be suitable for the particular application. The FAA considers these requirements substantially equal. Proposed paragraph (f) of § 23.963 is essentially the same as § 25.963(d), except for the differences in downward ultimate inertia forces between those listed in § § 23.561 and 25.561 respectively. The substantive differences between § § 23.963 and 25.963 occur in § 25.963(f) which contains specific requirements for pressurized fuel tanks to prevent the buildup of an excessive pressure between the inside and outside of the tank. The FAA is not aware of any adverse service experience because § 23.963 did not address pressurized fuel tanks in Part 23 airplanes. Moreover, the commenter did not present any information or data to support the contention that the present requirements are insufficient. Accordingly, the requirements are adopted as proposed.

Proposal 39—The FAA received no adverse comments to the requirements as proposed. Accordingly, the revision to § 23.997 is adopted as stated in the Notice No. 83-17.

Comments to Section 23.1143. Section 23.1143, Engine controls. One commenter contends that § 23.1143 should be revised to require a flight-idle gate as required by Part 135, Appendix A, paragraph 51. The FAA does not agree that § 23.1143 needs to be revised as recommended by this commenter and the requirement of § 23.1143(f) was revised by Amendment 23-17, effective February 1, 1977, and provides an equivalency to that of Part 135, Appendix A, paragraph 51, with respect to a flight-idle gate, as stated by this commenter.

Proposal 40—The FAA received no adverse comments to this proposal. Accordingly, the requirement is adopted as proposed.

Proposal 41—The FAA received no adverse comments to this proposal. Accordingly, the requirement is adopted as proposed.

Proposal 42—The FAA received no adverse comments to this proposal. Accordingly, the requirement is adopted as proposed.

Proposal 43—One commenter contends that the proposed requirements for fire-extinguishing systems are inadequate and should meet the standards contained in § 25.1195. This commenter states that passengers to and from the smaller communities deserve the same level of safety in this area as those flying transport category airplanes. Another commenter supports a requirement equal to the standards of § 25.1195 and contends that the General Accounting Office (GAO) study of safety standards on small passenger airplanes lists the need for more stringent fire-protection systems for small airplanes. This commenter states that the GAO report cites numerous fatal accidents caused by fire which started in the engine and spread to the wing. The January 4, 1984, GAO report is identified as "U.S. Government Accounting Office, *Report to Congress: Safety Standards on Small Passenger Aircraft With Nine or Fewer Seats Are Significantly Less Stringent Than On Larger Aircraft.*" A third commenter states that proposed § 23.1195 could cause interpretation difficulties and recommends that for commuter category airplanes, fire zones should be defined and treated in a manner similar to that of Part 25.

The FAA has carefully compared the requirements of §§ 23.1195 and 25.1195. Except for the "each designated fire zone" provision in § 25.1195, the requirements of paragraphs (a) of §§ 23.1195 and 25.1195 were found to be identical. With the exception of designated fire zones, the substantive requirements of paragraphs (b) of §§ 23.1195 and 25.1195 are contained in the first sentence of each subsection and are identical in wording. Section 25.1195(b) states "how compliance must be shown" in the second sentence of the paragraph, and a similar phrase is not contained within the proposed § 23.1195(b). The third sentence of § 25.1195(b) is permissive with respect to the use of individual "one-shot" systems for auxiliary power units, fuel burning heaters, and other combustion equipment. The fourth sentence of § 25.1195(b) requires for each other designated fire zone, two discharges must be provided, each of which produces adequate agent concentration; whereas § 23.1195(b) permits an individual "one-shot" system if all other requirements are met by the fire extinguishing system submitted for approval. The wording and, thus, the requirements of paragraphs (c) of § § 23.1195 and 25.1195 are the same, except § 23.1195 addresses "each compartment"; whereas, § 25.1195 addresses "each zone." The FAA, therefore, does not consider the requirements as proposed in § 23.1195 to be inadequate. Contrary to this commenter's contention, the FAA has determined that the requirements for fire extinguishing systems in commuter category airplanes, with the exceptions noted above, are substantially equal to those required in transport category airplanes. The FAA does not find that the "fire zones" concept for commuter category airplanes is needed.

Proposal 44—No adverse comments were received to the proposal. Accordingly, the requirements are adopted as proposed.

Proposal 45—No adverse comments were received to the proposal. Accordingly, the requirements are adopted as proposed.

Proposal 46—One commenter notes that § 23.1201(b) requires that components in an engine compartment must be "fireproof" and that provision is consistent with the philosophy of having a serviceable fire-extinguishing system for the full period during which a fire is expected to burn. The FAA agrees and the commenter correctly states the reason each system component of a fire-extinguishing system must be fireproof. Accordingly, the requirements are adopted as proposed.

Proposal 47—One commenter notes that § 23.1203(e) only requires a "fire resistant" standard for wiring and other components of the fire detector system and considers it to be inconsistent with other fire protection requirements. This commenter contends that the last event in the successful accomplishment of fire extinguishment of an engine fire is the resetting of the engine fire detector. This is of particular significance on engine installations where the nacelle is not visible from the flight deck. This commenter suggests that the requirement be upgraded to "fireproof" for wiring and other components of the fire detector system. The FAA does not agree with the need to upgrade the "fire-resistant" standard. Part 1 defines "fire resistant" in part, as follows, "With respect to fluid-carrying lines, fluid system parts, wiring, air ducts, fittings, and powerplant control, "fire resistant" means the capacity to perform the intended functions under the heat and other conditions likely to occur when there is a fire at the place concerned." The FAA has determined the requirements, as stated, is appropriate for fire detector systems and a revision of the section is not needed. Accordingly, the requirements are adopted as proposed.

Comment to Subpart F of Part 23. One commenter states that, in general, the FAA proposals for the systems and general designs of SFAR No. 41C brought the general requirements up to an acceptable level. The FAA agrees with this general comment.

Proposal 48—One commenter questions the need for a manifold pressure indicator for engines other than altitude engines; however, since the manifold pressure indicator may give the crew warning of developing engine trouble, the commenter does not oppose the proposal if no objection is received on economic grounds. The FAA received no other comments on this proposal. The requirement has been applied to recertification of SFAR No. 41 airplanes without adverse service experience. Accordingly, the requirement is adopted as proposed.

Proposal 49—One commenter contends that experience has shown that proposed § 23.1309(d) was subject to gross misinterpretation as Part 135, Appendix A, § 59, and its intent should be clarified, i.e., flight safety and not some nonessential function that may have been peripherally involved in certification. This commenter states that the second sentence of § 23.1309(d) should be revised to read:

"Where an installation, the functioning of which is essential to safe flight, requires a power supply, the installation must be considered an essential load on the power supply." The FAA does not agree because where an installation requires a power supply and its function is necessary to show compliance with the applicable requirements, the installation must be considered an essential load on the power supply and, accordingly, the applicable requirements are minimum requirements to type certification.

Another commenter states that although portions of § 25.1309 were incorporated into the proposed § 23.1309, the commenter sees no justification for not incorporating the whole of § 25.1309 into Part 23. The commenter offers no data or reasons in support of the contention that the proposal is not adequate or appropriate except that it does not incorporate the requirements of § 25.1309. In the absence of information to the contrary, the FAA finds the proposed standards appropriate to the commuter category airplane at this time.

One commenter suggests that the expression "safeguard against hazards" should be defined and clarified. Experience with recertification of airplanes to this requirement has not been adverse or controversial. However, § 23.1309 is being reevaluated in the Part 23 Airworthiness Review Program and these concerns will be addressed relative to all small airplanes. Accordingly, § 23.1309(d) is adopted as proposed.

Proposal 50—No adverse comments were received to the proposal. Accordingly, the requirements are adopted as proposed.

Proposal 51—No adverse comments were received to the proposal. Accordingly, the requirements are adopted substantially as proposed.

Proposal 52—One commenter notes that proposed § 23.1351(b)(2), (3), and (4) exclude commuter category airplanes from the present provisions of § 23.1351 concerning excitation of alternators. This commenter contends that these changes are not a part of the requirements of SFAR No. 41 or of Part 135, Appendix A and, therefore, should be removed. The FAA does not agree. Part 135, Appendix A, paragraph 61(b), requires in part, that the generating system must be designed so that the system voltage at the terminals of all essential load can be maintained within the limits for which the equipment is designed during any probable operating condition. The failure of the battery, as permitted by § 23.1351(b)(3), may result in the loss of the alternator and the failure of the battery is considered a probable operating condition. The requirements, therefore, are adopted as proposed.

Another commenter states § 23.1351(b)(5)(ii) supersedes § 23.1307(b)(1) and provides a higher level of system reliability. This commenter contends that a single master switch, as required by § 23.1307(b)(1), will increase the probability of a total generator electrical failure. This commenter recommends revision of § 23.1307(b)(1) to read: "(1) Except for commuter category airplanes, a master switch arrangement . . ."

The FAA does not agree that revision of § 23.1307(b)(1), as suggested by this commenter, is needed. The master switch arrangement requirement, not necessarily a single master switch as contended, assures expeditious disconnection of all electric power sources by a single action of the pilot for all load circuits in an emergency situation. The requirements are adopted as proposed.

Proposal 53—No adverse comments were received to the proposal. Accordingly, the requirements are adopted as proposed.

Proposal 54—One commenter states that to keep the Airplane Flight Manual requirements consistent with transport airplane standards, the relief provided by § 23.1581(b)(2) should not be allowed for commuter category airplanes and further contends that distinguishing approved information from unapproved information is important. This commenter recommends the addition of "Except for commuter category airplanes," before the words, "The requirements of paragraph (b)(1) . . ." in § 23.1581(b)(2). The FAA does not agree with the recommended revision of § 23.1581(b)(2) because the requirements, as stated, are considered clear and understandable regarding approved information and unapproved information in the Airplane Flight Manual.

No adverse comments were received to the proposed new paragraph (e) to § 23.1581. Accordingly, the requirement is adopted as proposed.

Proposal 55—One commenter states that zero fuel weight should be a limitation in accordance with SFAR No. 41, paragraph 4(a). The FAA agrees and the requirements of § 23.25, Weight limits, have been revised accordingly.

Another commenter contends that the operating limitations are insufficient, stating that even if spins are not approved, the commuter category airplanes should be tested for spin recovery, which is not required by this regulation. This commenter further contends that a standard method of spin recovery based on these tests should be in the Airplane Flight Manual. The FAA does not agree that commuter category airplanes should be tested for spin recovery because there is no requirement to test any multiengine airplane, normal category or transport category, for spins and spin recovery. This commenter offers no information or data to support a spin and spin recovery requirement.

One commenter states that the requirements of § 23.1583(c)(3)(ii) concerns ICAO Annex 8 compliance and should be deleted or made optional. The FAA does not agree. The issue of compliance with the requirements of ICAO Annex 8 has been discussed in detail previously in this preamble. Accordingly, the requirement of § 23.1583(c)(3)(ii) is adopted as proposed. This commenter contends that the reference to § 23.57 in proposed § 23.1583(c)(3)(iii) should be deleted. The FAA does not agree. This comment is directly related to establishing the operating limitations for the safe operation of commuter category airplanes and complying with the minimum requirements of ICAO Annex 8. Accordingly, the requirement is adopted as proposed.

Another commenter states that the detailed provisions of proposed § 23.1583(c)(3) depend upon the final form taken by the earlier requirements dealing with establishing takeoff, climb, and landing performance data. This commenter contends that since many of the performance requirements for transport category airplanes have been proposed for commuter category airplanes, any proposal for requirements relating to performance operating limitations should at least follow a review of the existing provisions of § 25.1533 and JAR 25.1533. The proposal to require performance operating limitations relating to continued and abandoned takeoff distances, takeoff and initial en route climb minima, landing distance, and go-around climb gradient minima is supported by this commenter. This commenter offers a text which does not differ fundamentally from proposed § 23.1583(c)(3). Some detailed differences do exist, however, which stem from changes proposed to the requirements relating to establishing performance and an effort to more closely align to the existing provisions of § 25.1533, JAR 25.1533, § § 121.189 and 121.195. A new section, § 23.1533, Additional operating limitations, is suggested by this commenter. The commenter's proposal for § 23.1533 covers all flight phases in the proposed § 23.1583(c)(3) of the Notice plus the takeoff run. The commenter states that the takeoff run constraint is necessary if credit is to be allowed for clearways in showing compliance with the takeoff performance operating limitations. This commenter notes that both the FAA and the commenter's proposals for commuter category airplane performance operating limitations go somewhat beyond the corresponding provisions for transport category airplanes of § 25.1533 and JAR 25.1533, since the proposal in the Notice includes consideration of landing distance. The FAA has carefully considered the comments and suggestions of this commenter. The FAA does not agree that the inclusion in § 23.1583(c)(4)(i) of the weight at which landing distance is determined in showing compliance with § 23.75 goes beyond the provisions in § 25.1533. Section 25.1533(a)(2) includes an equivalent requirement for transport category airplanes. Notice No. 83-17 sets forth requirements which include the intent of the commenter's suggested change. Structuring the airworthiness standards of Part 23 in exactly the same manner as Part 25 or JAR 25 is not needed. Therefore, the requirements are adopted as proposed in the Notice, except that in § 23.1583(c)(4)(i) "landing field length" is changed to "landing distance" to conform with § 23.75 as intended in the reference to § 23.75 in § 23.1583(c)(4)(i).

Proposal 56—One commenter contends that the procedures for a number of maneuvers, unique to the type certification of commuter category airplanes, should be covered in a new subparagraph § 23.1585(c)(5). These procedures are for continued takeoff following engine failure, an abandoned takeoff, an approach and landing with one engine inoperative, and a one-engine-inoperative go-around. This commenter offers a text for each of these procedures. The FAA does not agree that a requirement should be added to § 23.1585, Operating procedures, to specify each type of procedure. The present requirements plus those contained in new paragraph (h) are adequately stated in objective form and encompass the normal and emergency procedures necessary for safe operation of the commuter category airplane. Accordingly, the requirement is adopted as proposed.

Proposal 57—One commenter contends that the FAA proposal appears to be incomplete in that by cross-referencing § 23.1585, the requirement does not exist for the Airplane Flight Manual (AFM) to contain all of the performance data established in accordance with Subpart B—Flight. This commenter offers a revised text as an alternative to § 23.1587(d)(1) as proposed.

The current requirements of Subpart G—Operating Limitations and Information, however, state the overall requirements in an objective manner to assure safe operation of the commuter category airplane. The current requirements, plus those adopted by this amendment, are considered to be appropriate and assure safe operation of commuter category airplanes at this time. In this regard, the references to § 23.1585 in § 23.1587(d)(1) should read § 23.1583 because it relates to the takeoff weight limits in § 23.1583 rather than the operating procedure of § 23.1585. Accordingly, § 23.1587(d)(1) is adopted as proposed with the exception of the substitution of § 23.1583 for § 23.1585.

One commenter contends that the text of § 23.1587(d)(2), (d)(4), and (d)(6), as proposed, related to operating procedures rather than to performance information and is covered by the commenter's proposed revised text of § 23.1585(c)(5). The FAA does not agree that these requirements relate to operating procedures as such, but rather state the parameters of the conditions under which the performance information was obtained. An examination of the performance information requirements for transport category airplanes revealed similar requirements in § 25.1587, Performance information. Accordingly, § 23.1587 is adopted as proposed except as noted in the previous paragraph with regard to § 23.1587(d)(1).

One commenter contends that the extrapolated performance data required by § 23.1587(d)(3) should be available for all airplanes which the maximum takeoff weight exceeds the maximum landing weight and the requirement of § 23.1587(d)(5) should not be limited to just the commuter category airplane. The FAA recognizes the merit of these comments; however, these comments are outside the scope of this rulemaking action.

Proposal 58—One commenter notes that paragraph (b) of Appendix F of Part 23, does not address tests for small parts or wire and cable insulation and should be amended by prefacing paragraph (b) with the words: "Except as provided for materials used in electrical wire and cable insulation and in small parts, ..." In addition, this commenter states that paragraph (b) should be revised to refer to tests under paragraphs (d) and (e) of this Appendix plus instructions for mounting the specimen referred to in paragraph (e). The FAA has determined that the prefacing words suggested are not appropriate to paragraph (b) because if the Administrator finds that these items would contribute significantly to the propagation of a fire, these items must then be tested as stated in § 23.853(d)(3)(v) or by other approved equivalent methods. The FAA agrees with the commenter that paragraph (b) of Appendix F should be revised to refer to the tests under paragraphs (d) and (e), not just paragraph (d) of the Appendix. The FAA also agrees with the commenter that instructions for mounting the specimen referred to in paragraph (e) should be included, and paragraph (b) is revised to include the instructions for mounting the specimen for the horizontal test of paragraph (e). These instructions are substantially the same as those of Appendix F, paragraph (b) of Part 25 which contain an acceptable test specimen configuration for performing the horizontal test.

Another commenter notes that the minimum temperature at the flame center should be 1550°F as stated in paragraph (d). The FAA agrees, and the temperature is changed accordingly.

Proposal 59—No adverse comments were received to this proposal. Accordingly, the requirements are adopted as proposed.

Additional Comments.

One commenter recommends inclusion of a number of additional requirements from the airworthiness standards of Part 25 for type certification of the commuter category airplane, which this commenter considered necessary, as a minimum, in any regulation dealing with scheduled air transportation.

The FAA is of the opinion that the public should be made aware of these comments and the disposition of them by the FAA. The following areas of Part 25 were addressed by this commenter. The commenter states the requirements of § 25.631, Bird strike damage, and § 25.775, Windshields and windows, should be included to assure that the empennage and cockpit windows of commuter category airplanes are capable of absorbing a specified bird strike without incurring flight critical damage to the empennage or the cockpit and/or flight crew. This commenter contends that this category of airplane, because of the planned operating altitudes and stage lengths, will normally be exposed to the possibility of bird strike at a greater rate than most Part 25 airplanes, and because commuter category airplane speed below 10,000 feet will not be much different than the transport category of airplane. Therefore, this commenter states that the commuter category airplane should have the same protection from a bird strike as the transport category airplane. The FAA recognizes the possible merit in the recommendation made by this commenter; however, this addition is considered to be outside the scope of the original proposal. The FAA has included the recommendations in the Part 23 Airworthiness Review program.

This commenter contends that § 23.671, Control systems, General, is too broad and lacks specificity in that it does not address failures of the control system. This commenter states that a definite need exists to address both single and multiple failures of a control system in the manner addressed by § 25.671 and feels confident that most manufacturers are already complying with this requirement; therefore, the requirement should not be a major economic burden. The FAA does not agree that § 23.671 should be revised to read as § 25.671. Part 23 contains other requirements for control systems that provide substantially the same level of safety as does § 25.671. Specifically, the requirements of § 23.677, Trim system, address the failure of a single element in the primary flight control system and require that subsequent to that failure, adequate control should be available for safe flight and landing.

The commenter contends that the requirements of paragraph (b) stated in § 25.1303, Flight and navigation instruments, if made applicable to the commuter category airplane, would give the FAA the authority to require basic flight instruments for both the pilot and copilot and paragraph (c) would require warning devices for the more sophisticated commuter airplanes where compressibility is a factor. The reason given by this commenter for this contention depends on the commenter's interpretation of present Part 23 requirements and may not require flight instruments for both pilot and copilot. The FAA does not agree that the requirements of § 25.1303(b) should be made applicable to the commuter category airplane. The present airworthiness standards provide sufficient flexibility to require flight and navigation instruments at required pilot positions in accordance with § 23.1321 to safely operate the commuter category airplane without adopting the requirements as stated in § 25.1303(b). With regard to the comment addressing warning devices as required by § 25.1303(c), § 23.1303(e) has substantially the same requirement for a speed warning device as § 25.1303(c).

Another commenter stated that present Part 23 requirements permit single source information; e.g., static pressure, to be fed to both the pilot's and copilot's instruments. This commenter contends that reports, especially in pressurized airplanes, have indicated that a leak in one instrument or line has caused all static-sensing instruments on both the pilot's and copilot's panels to become totally useless and damaged. The FAA recognizes the merit of this comment; however, the commenter does not provide any data to support the contention. Additionally, the FAA is not aware of any service difficulty problems with the recertification of airplanes to SFAR No. 41 with single source information. Consequently, the FAA is of the opinion that such a requirement should be reexamined during the Part 23 Airworthiness Review Program.

The comment was received that present Parts 23, 25, 121, and 135 do not address "Floor Proximity Emergency Escape Path Marking." However, Amendments 25-38 and 121-183 (49 FR 43182, October 26, 1984) requiring floor proximity escape path markings for Parts 25 and 121, Rules Docket 23792, address this subject. The commenter recommends that the FAA give serious consideration to incorporating the requirements adopted in Amendments 25-38 and 121-183 into Parts 23 and 135. Further, recommendations were made that the FAA should consider the requirements of emergency provisions in Part 25 for the commuter category airplane and extend the requirements of § 135.177, Emergency equipment requirements for aircraft having a passenger seating configuration of more than 19 passengers, to include the commuter category airplane. If the requirements of § 135.177 were extended to the commuter category airplane, then the requirements of § 121.310 would be included automatically in accordance with § 135.177(a)(4). The FAA has considered carefully the comments made, reviewed the requirements of § § 135.177 and 121.310, and has concluded that these requirements are overly stringent, considering the distance between the seats and the nearest emergency exit, for the size of the airplane to be type certificated in the commuter category.

This commenter contends that Part 135, Subpart I-Airplane Performance Operating Limitations, authorizes takeoffs at weights that would not allow an airplane to clear all obstacles if an engine should fail after V_1 and recommends that § § 121.177 and 121.189 — Takeoff limitations, should be required for commuter category airplanes operated in accordance with Part 135. The FAA does not agree with this commenter's contention that should an engine fail after V_1, the commuter category airplane would not be able to clear all obstacles. The Airplane Flight Manual contains operating limitations related to one-engine-inoperative takeoff and climb requirements and obstacle clearance requirements when operated pursuant to Part 135, and § 135.399 prohibits operations beyond these operating limitations. The FAA also considers the takeoff limitations for Part 135 operations with commuter category airplanes substantially equivalent to those requirements stated in § § 121.177 and 121.189.

This commenter states that the FAA should not authorize Designated Engineering Representatives (DER) or Delegation Option Authorization (DOA) approval of ice protection systems.

The contention is that the FAA should be personally involved in both the system approval and flight test program, and this commenter states that their experience has shown that some of those airplanes certificated through the designee program had serious problems with their ice protection systems. The FAA does not agree that designees should be prohibited from the approval of ice protection systems. The involvement of the FAA in approval of ice protection systems by designees is determined on a case-by-case basis. The FAA sees no reason to change this procedure.

This commenter summarizes by stating a belief that the traveling public would be served better if Part 23 remained as presently written and all airplanes configured for 10 or more passengers were classified in the large transport category and certificated to Part 25 as required by Amendment 23-10 (36 FR 2863, February 11, 1971). The commenter contends that if a particular applicant needed relief from a specific portion of Part 25, the applicant could apply for and gain relief for justified requests. The FAA thoroughly examined the options available to establish airworthiness standards for an airplane of the size proposed for the commuter category and Notice No. 83-17 was the appropriate course to follow. Subsequent events to Amendment 23-10 in addition to the withdrawal of proposed Part 24—Light Transport Airworthiness Review Program support the need for airworthiness standards for the commuter category airplane by size, weight, and expected operational use. The comments support the decision to amend Part 23, as stated in Notice No. 83-17.

As discussed in the preamble to this amendment, the scope and objective of this rulemaking action are to integrate into Part 23, the airworthiness standards considered necessary for the commuter category airplane. The intent is not to propose substantive changes to Part 23 or to the airworthiness standards being integrated into Part 23, except as discussed in the Notice. The FAA is concerned about bird strike damage to windshields, as suggested by this commenter, and is of the opinion that further study is necessary before rulemaking action is taken on this additional suggestion for commuter category airplanes.

Section 21.17, Designation of applicable regulations. One commenter notes § 21.17(b) specifies the life of a type certificate application as 5 years for the transport category and 3 years for other categories. Current evidence indicates, according to this commenter, that 3 years is not sufficient for the approval of present Part 23 airplanes; accordingly, 3 years is contended to be inadequate for the commuter category. This commenter recommends that § 21.17(b) be changed to allow 5 years for all type certificate applications. The commenter submits no data or evidence that the current 3-year time limit for a type certificate application is inadequate. Therefore, the section is not amended under this rulemaking action.

Proposals 60 through 72—These proposals were to amend Part 21 to permit the type certification of commuter category airplanes in the same manner as other airplanes. No adverse comments were received to these proposals. Accordingly, the proposals are adopted as stated in the Notice. However, a discussion on the issuance of airworthiness certificates for normal and commuter category airplanes under the provisions of § 21.183 has been included in the discussion of proposal number 3.

Proposals 73 through 78—Two commenters address the issue of the proposed extension of Part 36, Appendix F, standards to the new commuter category airplane. One commenter suggests an applicant be permitted to show compliance with Part 36 by complying with either Appendix F, which contains the standards for propeller-driven small airplanes, or with Appendix C, which contains the standards for transport category large airplanes. The FAA does not concur with this suggestion for two reasons. First, data collected both by the United States and by the International Civil Aviation Organization (ICAO) shows that turbine-powered, propeller-driven airplanes below the 19,000 pound limit would have little difficulty meeting the Appendix F limit. Second, the Appendix C standard was developed primarily for larger airplanes including the large commercial turbojet-powered airplanes. Accordingly, Appendix C involves more precision testing and data correction. Since the Appendix C tests are considerably more expensive to the applicant, the FAA considers the suggestion to be impractical and not in the public interest.

Several comments on the noise issue were received as these issues relate to consistency of the proposed commuter category standards with both existing and future ICAO noise standards for propeller-driven airplanes. As the commenters point out, the United States and ICAO have different rulemaking cycles and, as a consequence, an inconsistency between the two standards will result when the proposals of Notice No. 83-17 are adopted. The United States and members of ICAO currently are developing an improved noise standard for small propeller-driven airplanes. When this cooperative effort is completed, the FAA will consider amending Part 36 to require compliance with these improved standards for appropriate categories of airplanes, including the commuter category.

Accordingly, the proposals to amend Part 36 are adopted as stated in the Notice.

Proposal 79—Notice No. 83-17 proposed to amend § 91.213, Second-in-command requirements, to allow operation of a commuter category airplane without a pilot who is designated as a second in command (SIC) if that airplane is type certificated for operations with one pilot.

Section 91.213 was first adopted on July 17, 1972 (37 FR 14758; July 25, 1972), in response to the safety concerns of the flying public. The majority of the public comments favored the SIC requirements of that section. The only exception to the two-pilot requirement of § 91.213 is a provision for existing SFAR 41 airplanes. The exception was adopted (47 FR 30946; July 15, 1982) to relieve Part 91 operators of SFAR 41 airplanes of a perceived economic burden. Notice No. 83-17 proposed to allow operation of certain commuter category airplanes without an SIC in essentially the same manner as an SFAR 41 airplane.

The FAA received 28 comments in response to the NPRM. Only one commenter specifically addresses the SIC requirements. That commenter opposes the adoption of the § 91.213 proposal. Another commenter later submitted a comment opposing those comments.

The Federal Aviation Act of 1958 charges the FAA with the duty of promoting safety of flight of civil aircraft and empowers the FAA to prescribe minimum standards as may be required in the interest of safety. In prescribing these standards, the FAA must make classifications of such standards, as appropriate, to maintain an equivalent level of safety for operations with varying levels of complexity and varying degrees of risk to the public. It necessarily follows that the more complex the operation and the greater the public exposure to risk, the higher the standards that are required.

In this connection, the FAA has had some safety concerns regarding the single-pilot operation of airplanes certificated for operation with up to 19 passengers as proposed in the NPRM. By its very nature, operation of an aircraft with a single pilot cannot provide a level of safety equivalent to operation by a crew of two or more.

There must be some point at which it is reasonable to require two pilots for all operations under Part 91. The current 12,500-pound weight demarcation between small and large airplanes was established more than 40 years ago and was based upon prevailing and anticipated future aircraft design considerations. Whether the demarcation of 12,500 pounds is arbitrary is not an issue in this rulemaking action. However, some line of demarcation must be drawn that will act as a buffer between the competing forces of safety and economics.

The FAA has determined, however, that this rulemaking action should not be delayed, nor is it within the scope of this action, to address all flightcrew requirements for future operations under Part 91. To do so would place an undue economic hardship on aircraft manufacturers who have ongoing airplane certification programs. Nevertheless, the FAA must establish, in the interest of safety, a line of demarcation in this final rule for those commuter category airplanes that need two pilots for all operations regardless of weight or type of operations. Other issues involving flightcrew requirements for Part 91 operations will be handled by a separate rulemaking action.

Based upon a careful review of additional safety data and comments received during the regulatory process, the FAA will amend § 91.213(a)(1) to require two pilots for all operations of commuter category airplanes except commuter category airplanes that (a) have a passenger seating configuration, excluding pilot seats, of nine seats or less and (b) are type certificated for operations with one pilot. This line of demarcation will be consistent with that of Part 23 for certification of small airplanes and Part 135, which governs the operations of air taxi and commercial operators.

Based upon the comments to the NPRM and the safety concerns discussed herein, the FAA is requesting further comments on the 9 seats or less demarcation for single-pilot operations under § 91.213(a)(3). The FAA will review all additional comments submitted. If those comments and further study by the FAA indicate a need to make further regulatory changes, the FAA will initiate the appropriate action prior to the effective date of these amendments. Comments submitted to Docket No. 23516 within 45 days after the publication of this rule in the *Federal Register* will be considered.

Proposal 80—One commenter does not agree with the FAA's decision to classify commuter category airplanes as small airplanes. This commenter contends that numerous safety related items, such as pilot type rating, second-in-command requirements, and flight instruments for the second in command would be required if the airplanes were considered large instead of small. This commenter states that § § 61.58, 91.4, and all of Subpart D of Part 91 would automatically be applicable when the airplane is being operated in accordance with operating rules other than Part 135. In addition, this commenter states that these same airplanes should have to comply with § 135.175 which relates to airborne weather radar in lieu of § 135.173, Airborne thunderstorm detection equipment.

In response to the commenter's position on classifying the commuter category airplane as a small airplane, the FAA has reexamined proposed § 135.4 and has determined that designation of all sizes of commuter category airplanes as small is not appropriate for Part 135. Accordingly, proposed § 135.4 to identify a commuter category airplane as a small airplane for the purposes of Part 135 is not adopted. Commuter category airplanes have been included in § § 135.169 and other sections of Part 135 as discussed in proposals 81 and 82 below.

The FAA agrees with the commenter that the airborne weather radar requirements of § 135.175 should apply to commuter category airplanes. While this requirement was not specifically proposed in Notice No. 83-17, the FAA will consider whether such an equipment requirement can appropriately be imposed based on the provisions of § 135.149(e).

Proposal 81—No adverse comments were received directly addressing this proposal. However, due to the nonadoption of § 135.4 as discussed above, § 135.169 has been revised by changing the wording of § 135.169(a) to permit the operation of a large commuter category airplane under Part 135 and exempt that category airplane from the cited requirements of Part 121. In some cases, these cited requirements of Part 121 would require the airplane design to include provisions that would be beyond the scope of Notice 83-17. As previously discussed, the FAA is considering additional cabin safety and occupant protection requirements for commuter category airplanes. The additional requirements of Part 121 will be considered as a part of that rulemaking project. To permit the operation of small commuter category airplanes under Part 135, § 135.169(b) is adopted as proposed. Because no commuter category airplane could have been operating under Part 135 prior to August 19, 1977, the proposed § 135.169(c)(2)(iii) is not adopted.

Proposal 82—Following the above identified changes to § 135.169, it was also necessary to review the proposal for § 135.399. As proposed, this section contained performance operating limitations for small nontransport category airplanes and commuter category airplanes, with the possibility of confusion occurring. To clearly identify the performance operating limitations for each of these two categories of airplanes, the proposal for § 135.399 has been revised by providing a new § 135.398 Commuter category airplane performance operating limitations, which includes only those requirements proposed for commuter category airplanes. Performance operating limitations for small nontransport category airplanes remains unchanged in § 135.399. In addition, § 135.363 has been revised by adding a new paragraph (j) to require operators of commuter category airplanes to comply with § 135.398.

One commenter agrees with a requirement for consideration of the required takeoff flight path data. However, the proposal is keyed to ICAO Annex 8 and the commenter contends that the word "net" should be deleted from the proposed § 135.399(b). The FAA does not agree since the net takeoff flight path data is required to provide the necessary level of safety for operation of the commuter category airplane under the provisions of Parts 91 and 135. New § 135.398(b) is adopted as proposed for § 135.399(b).

Another commenter states that if the intended level of safety is to be achieved, a clear statement is needed regarding the performance operating rules which are applicable to commuter category airplanes. This commenter contends that this need is not met by § 135.399, either in its existing form or proposed form. The commenter states that since the scheduled performance data for commuter category airplanes is very similar to that of transport category airplanes, any proposed performance operating rules for commuter category airplanes modeled on existing provisions for transport category airplanes in Part 121 would seem reasonable. A proposed text is offered detailing performance operating rules for inclusion in Part 135. The FAA does not agree. The existing requirements, and the amendments adopted by this action, provide for an appropriate level of safety for operations under the provisions of Part 135 for commuter category airplanes and more detailed requirements are considered unnecessary at this time.

Economic Impact

A regulatory evaluation has been conducted and a copy is available in the docket. A copy may be obtained by contacting the person identified under FOR FURTHER INFORMATION CONTACT.

This final rule provides for the certification and operation of a new category airplane, the commuter category. To accomplish this end, there are approximately 82 specific changes to the FAR. With four exceptions, all changes are similar in substance to requirements previously applied to propeller-driven airplanes of a size approximating that of the commuter category. The four exceptions require: (1) compliance with ICAO Annex 8, Part III, (2) consideration of obstacle clearance for takeoffs in Part 135 operations, (3) commuter category airplanes with more than 9 passenger seats to be operated in Part 91 operations with a second pilot, and (4) commuter category airplanes to be defined as large and small for Part 135 operations.

There are no additional costs associated with these amendments, since they do not amend the requirements applicable to any existing airplane category, but rather, provide an option for manufacturers to certificate propeller-driven airplanes of this size to requirements other than those applicable to transport category airplanes.

The provisions proposed in the previously withdrawn draft of Part 24 for light transport category airplanes, and the detailed airworthiness standards of Part 25, have not been applied to certification of new airplane designs of the commuter category size because the costs of compliance exceeded the benefits from future sales, purchase, and operation.

The benefits of having a commuter category certification standard in Part 23 are not readily quantifiable. However, based upon a study conducted when the FAA was considering a new Part 24, the cost of certificating a hypothetical 30-seat airplane under Part 25 would have cost $8,000,000 more than certificating under SFAR No. 41, Appendix A of Part 135. The unit cost of production of the airplane certificated to the airworthiness standards of Part 25 would have been approximately $200,000 higher. Clearly certification under Part 25 would be considerably more expensive than under the requirements of Part 23 as amended by this final rule. A copy of the study is filed in Docket No. 18600 for examination by interested persons.

Regulatory Flexibility Determination

The FAA has also determined that the rule changes will not have a significant economic impact on a substantial number of small entities. The FAA's criteria for a small airplane manufacturer is one employing less than 75 employees, and a substantial number is a number which is not less than 11 and which is more than one-third of the small entities subject to the proposed rules, and a significant impact is one having an annual cost of more than $14,258 per manufacturer.

A review of domestic general aviation manufacturing companies indicates that only six companies meet the size threshold of 75 employees or less. The amendments will therefore not affect a substantial number of small entities.

Trade Impact

The amendments to the FAR will improve trade opportunities for both U.S. firms doing business overseas and foreign firms doing business in the United States. In addition, the amendments have the beneficial impact of allowing a wider range of airplanes to be certified under Part 23.

Conclusion

For the reasons discussed earlier in the preamble, the FAA has determined that this document (1) involves regulations which are not considered to be major under the procedures and criteria prescribed by Executive Order 12291, and (2) is not significant under Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). I certify that under the criteria of the Regulatory Flexibility Act, these final rules will not have a significant economic impact on a substantial number of small entities. In addition, these final rules will have little or no impact on trade opportunities for U.S. firms doing business overseas or for foreign firms doing business in the United States.

Adoption of the Amendments

Accordingly, Parts 21, 23, 36, 91, and 135 of the Federal Aviation Regulations (14 CFR Parts 21, 23, 36, 91, and 135) are amended effective February 17, 1987.

The authority citation for Part 21 is revised to read as set forth below, and the authority citations following each of the sections of Part 21 are removed:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C. 1857f-10, 4321 et. seq.; E.O. 11514; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

Amendment 21-60

Designation of Applicable Regulations for the Type Certification and Airworthiness Certification of Special Classes of Aircraft

Adopted: March 3, 1987 **Effective: April 13, 1987**

(Published in 52 FR 8040, March 13, 1987)

SUMMARY: This amends Part 21 of the Federal Aviation Regulations (FAR) by providing procedures for the type certification and airworthiness certification of special classes of aircraft. Special classes of aircraft include gliders (including self-launching gliders), airships, and other kinds of aircraft that would be eligible for a standard airworthiness certificate but for which no airworthiness standards have as yet been established as a separate part of Subchapter C of the FAR. An example of such standards is designated in Advisory Circular (AC) 21.23-1 for the type certification of fixed-wing gliders under § 21.23. This amendment broadens the concept presently applied to gliders to include airships and future nonconventional aircraft as the need may arise. In addition, this amends §§ 21.21, 21.175(a) and 21.183 to include manned free balloons, which were inadvertently omitted in previous amendments to Part 21.

FOR FURTHER INFORMATION CONTACT: Lyle C. Davis, Policy and Procedures Branch (AWS-110), Aircraft Engineering Division, Office of Airworthiness, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, DC 20591; Telephone (202) 267-9583.

SUPPLEMENTARY INFORMATION:

BACKGROUND

This amendment is based on Notice of Proposed Rulemaking (NPRM) 85-21, which was published in the *Federal Register* on October 18, 1985 (50 FR 42368). The NPRM revises the type certification procedural rules in portions of Subparts B and H of Part 21 of the FAR to provide a procedural basis upon which airworthiness criteria may be designated as necessary for the type certification of special classes of aircraft. When the NPRM was published, The FAA had five applications for the type certification of airships. Prior to this amendment, no procedural rules were available for airship type certification.

There are currently numerous commercial development projects related to special classes of aircraft for which application may be made for FAA type certification. Accordingly, the FAA amends § 21.17 to establish procedural requirements for the issuance of type certificates for special classes of aircraft (including airships) that comply with the applicable airworthiness standards of the FAR or such other airworthiness criteria that provide an equivalent level of safety to those standards. Means are provided to designate applicable airworthiness criteria for the type certification of special classes of aircraft by selecting appropriate provisions of the airworthiness standards currently in the FAR.

In the event that the airworthiness standards in the FAR are either inadequate or otherwise inappropriate as a certification basis for a special class of aircraft, due to its unique, novel, and/or unusual design features, other airworthiness criteria may be established if the Administrator finds that such criteria provide the special class of aircraft with a level of safety equivalent to that provided for other types of aircraft by the FAR Parts listed in Subchapter C. Such additional airworthiness criteria may be provided by an FAA AC, or, once approved by the Administrator, by a designer, manufacturer, or other person. These airworthiness criteria would be announced in the *Federal Register* for comment, in a manner similar to that used for AC's, prior to their initial application as the certification basis of a special class aircraft.

Notice 85-21 states that the Administrator would issue special conditions in the event that the standards in the FAR are either inadequate or otherwise inappropriate as a certification basis due to the unique, novel, and/ unusual design features for a special class of aircraft. After further review, it has been determined that it would be inappropriate to use special conditions as a part of the certification basis for special classes of aircraft.

Special conditions are issued when it is determined, during a type certification program, that the FAR do not provide adequate certification standards because of a novel or unique feature in an aircraft, aircraft engine or propeller. The process of issuing special conditions was established within the rules to ensure that a timely regulatory process existed, whereby the FAA could add to the existing airworthiness standards listed in Subchapter C, when establishing the certification basis for an aircraft, aircraft engine, or propeller. In the case of special classes of aircraft, some or all of the applicable airworthiness standards are not contained in the FAR, and are established in accordance with § 21.17(b). In the case of airships, the FAA will issue a report containing airworthiness design criteria it considers to be appropriate for conventional state-of-the-art airships. These criteria, after publication for comment, would become the applicable airworthiness standards for conventional airships. Should an applicant propose to use those standards for an unconventional design, additional airworthiness standards may be necessary. The modified original design criteria or a completely new set of standards could be developed and approved in accordance with § 21.17(b) without resorting to § 21.16 for the establishment of special conditions. Thus, while the need still exists for a process to continually update the airworthiness standards, in order to establish an appropriate certification basis for special classes of aircraft with novel and/or unique features, the process for establishing the certification basis in § 21.17(b) is sufficient to fulfill that need.

DISCUSSION OF THE AMENDMENT

Special classes of aircraft include gliders (including self-launching gliders), airships, and other kinds of aircraft that would be eligible for a standard airworthiness certificate but for which no airworthiness standards have as yet been established as a separate part of Subchapter C of the FAR. This amendment establishes procedures for the development and application of airworthiness standards and criteria for special classes of aircraft for which adequate airworthiness standards do not exist in the FAR. The use of these criteria for type certification of special class aircraft is permitted providing the Administrator finds that, to the extent that the criteria do not meet the applicable airworthiness standards cited in Subchapter C, they provide a level of safety equivalent to those standards.

New Section 21.17(b) of the FAR provides a certification procedure for special classes of aircraft that previously lacked a regulatory basis for type certification. Aircraft, including the engines and propellers installed thereon, for which airworthiness standards have been issued as a separate part include: normal, utility, and acrobatic category airplanes, Part 23; transport category airplanes, Part 25; normal and transport category rotorcraft, Part 27 and 29; manned free balloons, Part 31; aircraft engines, Part 33; and propellers, Part 35. These Parts are used by the Administrator, to the maximum extent practicable and as considered appropriate, to designate the applicable airworthiness criteria for the type certification of special classes of aircraft, including the engines and propellers installed thereon.

Prior to this amendment, § 21.23 established type certification procedures for gliders, both powered and unpowered. In this regard, the FAA issued AC 21.23-1, which provides several acceptable means of compliance for the type certification of gliders. Section 21.23 is deleted by this amendment. However, the concept of § 21.23 is preserved in the new paragraph (b) of § 21.17, and AC 21.23-1 will be renumbered as AC 21.17(b)-1 without substantive change.

Pursuant to § 21.17(a)(1), the applicable airworthiness standards for existing type certificate applications are those in effect on the date of application. Prior to adoption of this amendment, the FAA received several applications for the type certification of airships. Since no procedural rules or appropriate regulations existed for special classes of aircraft (e.g., airships) at the time of receipt of these applications, it is appropriate to allow the applications to remain effective until 3 years after the effective date of this amendment. The applicants may also choose to reapply for a type certificate in accordance with the revised § 21.17(b).

The term "manned free balloons" was inadvertently excluded in past amendments to Part 21 with respect to the titles of §§21.21 and 21.183 and the first paragraph of § 21.175. Accordingly, this amendment corrects these titles and § 21.175 to include the term "manned free balloons." In effect, these paragraphs have been interpreted as also being applicable to manned free balloons. Thus, these regulatory changes have no effect on actual FAA practices. In addition, the term "special classes of aircraft" is added to the title and lead-in paragraph of § 21.21, and § 21.175(a), and to the title of § 21.183 to allow for the issuance of type and airworthiness certificates for special classes of aircraft.

To clarify that special classes of aircraft will be required to have Instructions for Continued Airworthiness similar to those required in the airworthiness standards of Subchapter C, §§ 21.31(c) and 21.50(b) are revised to specify that the Airworthiness Limitations section of the Instructions for Continued Airworthiness constitutes a part of the type design for special classes of aircraft.

There are no other substantive differences between the proposed rule and the final rule.

DISCUSSION OF COMMENTS

Six comments were received in response to Notice 85-21, representing the views of aircraft operators, aircraft and equipment manufacturers, and private individuals. The commenters support the objectives of the notice, and some request that the proposals be expanded to provide criteria for determining the degree of specialty or uniqueness. The FAA finds that it is not practical or possible to foresee the types of special class aircraft that may evolve in the future or to attempt to formulate any criteria in anticipation of those types. While gliders and airships are cited as obvious examples of special classes of aircraft, other designs that are not obviously in one category or another will require evaluation on an individual basis.

One commenter contends that the special class aircraft category should be expanded to include small, low-powered, sport-type, aircraft in lieu of Part 23 of the FAR. The FAA intends that the special class aircraft category include those aircraft that would: (1) be eligible for a standard airworthiness certificate; (2) not be eligible for certification under any of the parts listed in Subchapter C of the FAR due to their unique, novel, and/or unusual design features; and (3) have a level of safety equivalent to that provided by type certification under other airworthiness Parts of Subchapter C. The decision to type certificate an aircraft in either the special class aircraft category or under Part 23 of the FAR is entirely dependent upon the aircraft's unique, novel, and/or unusual design features. The level of safety for the special class aircraft category would be equivalent to that provided by Part 23 of the FAR, and, therefore, the level of safety would not enter into the selection of either of these categories in lieu of the other.

The same commenter suggested that ultralight aircraft be included in the special class aircraft category. The FAA is currently studying the petition filed jointly by the Aircraft Owners and Pilots Association (AOPA) and the Experimental Aircraft Association (EAA) to establish a new category of aircraft entitled primary category. This proposal is envisioned to be applicable to aircraft intended for personal use, and would have simplified design requirements; simplified type certification and airworthiness certification procedures; and simplified, maintenance provisions. Ultralight aircraft would likely fall under such a primary category, if the proposal is adopted as envisioned. However, each design that is not obviously in one category or another will require evaluation on an individual basis.

In a related matter, several commenters suggest that the FAA allow type certification of a simplified aircraft both in the proposed primary category, as defined in the petition filed jointly by AOPA and EAA, and as a special class aircraft under this amendment. It is envisioned that the petitioners' proposed primary category and the special class aircraft category adopted under this amendment will apply to different types of aircraft, and will have different type certification and airworthiness certification procedures. Therefore, type certification of an aircraft in both of these categories would be inappropriate.

One commenter suggested that consideration should be given to adjusting the operating rules to accommodate the unique operating features of special classes of aircraft. Amending operating rules, which is outside of the scope of this rulemaking, would not be practical or possible at this time, since the FAA cannot accurately anticipate all of the unique operating features of future special classes of aircraft.

One commenter requests that his type of aircraft (a rotorcraft derivative) be included in the example for special classes of aircraft. The rotorcraft derivative may qualify under one of the airworthiness regulations listed in Subchapter C. Therefore, this type of aircraft would not qualify under the definition of special classes of aircraft.

Many comments were received in response to the publication of draft AC 21.17(b)-2 and FAA-P-8110-2, "Airship Design Criteria," which were published in the *Federal Register* on October 18, 1985, (50 FR 42243). Comments on the AC and the Airship Design Criteria, which are not part of this rulemaking, will be considered in the development of the final AC and Airship Design Criteria.

Planned Advisory Circular (AC) and Airship Design Criteria.

The preamble of NPRM 85-21 announced the availability of proposed airship airworthiness criteria, which are contained in AC 21.17(b)-2 and FAA-P-8110-2. These are companion documents that will provide acceptable criteria for type certification of airships as permitted by this amendment. As additional airworthiness criteria for airships are approved, AC 21.17(b)-2 will be revised to identify these criteria.

ECONOMIC ANALYSIS

The assumptions used to support the estimates in determining the economic impact of the proposed changes to §§ 21.17, 21.21, 21.31, 21.50, 21.175, and 21.183 have been developed by the FAA. The amendments to §§ 21.175 and 21.183 are editorial and clarifying only and have no economic impact. The anticipated benefit derived from the changes to §§ 21.17, 21.21, 21.31, and 21.50 will be the potential economic value of manufacturing and operating safe airships in the United States (wages, interest, rent, and profits) while maintaining an acceptable level of public safety. Quantification of these benefits is not possible because of the highly speculative nature of potential airship markets and the undetermined time that may elapse before a type certificate is actually issued. Nonetheless, this amendment will provide for U.S. type certification of special class aircraft designs and will also encourage and reinforce commercial development of innovative and utilitarian aircraft. Manufacturers will incur administrative costs, because they will be required to submit type design drawings, test reports, and computations necessary to show proof of compliance with this amendment. The FAA estimates that this effort will involve a maximum total of $104,000 per certification. The anticipated benefits of this amendment include increased convenience and expedition in the type certification process which, in the absence of this amendment, would otherwise consume time to develop a new type certification basis for each special class of aircraft. With this amendment in place, applications for special classes of aircraft type certificates will be processed more quickly since a procedure, and possibly applicable airworthiness standards, for their type certification will already exist. We anticipate the benefits associated with the convenience afforded by this rule will outweigh the costs related to the amendment.

The FAA finds that these costs are consistent with the costs that any future applicant would incur in the process of seeking to obtain a type certificate for a special class aircraft for which no airworthiness criteria have been established in the FAR.

Trade Impact Statement

These rules will have little or no impact on trade opportunities, because newly-manufactured airships for the U.S. market, whether made by U.S. or foreign manufacturers, would have to comply with rules or other criteria which would provide an equivalent level of safety.

CONCLUSION

The FAA has determined that this amendment (1) is not a major rule under Executive Order 12291; and (2) is not a significant rule under Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). Further, it is certified that this amendment will not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act, as relatively few small entities will be affected. The FAA small entity size standards criteria define a small aircraft manufacturer as an independently-owned and managed firm having fewer than 75 employees. A substantial number of entities is defined as more than ⅓ of the entities subject to the rule, but not less than 11. Under the FAA size standards, only one of the manufacturers currently applying for an airship type certificate has fewer than 75 employees. A copy of the regulatory evaluation prepared for this action is contained in the regulatory docket. A copy of it may be obtained by contacting the person identified under the caption "FOR FURTHER INFORMATION CONTACT."

ADOPTION OF THE AMENDMENT

Accordingly, Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended as follows, effective April 13, 1987.

The authority citation for Part 21 continues to read as follows:

AUTHORITY: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C 1857(f)-10, 4321 et seq.; E.O. 11514; 49 U.S.C. 106(g) (Revised Pub L. 97-449, January 12,1983).

Amendment 21-61

Noise Standards for Helicopters in the Normal, Transport and Restricted Categories

Adopted: January 21, 1988 **Effective: February 5, 1988**

(Published in 53 FR 3534, February 5, 1988)

SUMMARY: This final rule adds to the Federal Aviation Regulations noise certification standards applicable to helicopters. This rule applies to civil helicopters in the normal, transport, and restricted categories and provides noise level limits and test procedures for the issuance of original and amended type certificates. The rule prohibits changes in type design of helicopters that may increase noise levels beyond certain limits. This rule does not limit further manufacturing of existing helicopter types. This rule provides for commonality between U.S. standards and those adopted by the International Civil Aviation Organization (ICAO). In addition, the rule contains the technical noise measurement and procedures for conducting and evaluating helicopter noise tests. This rule is necessary to provide current and future relief and protection of the public health and welfare from helicopter noise.

FOR FURTHER INFORMATION CONTRACT: Mr. Steven R. Albersheim, Noise Policy and Regulatory Branch, (AEE-110), Noise Abatement Division, Office of Enviroment and Energy, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, D.C. 20591; telephone (202) 267-3560.

SUPPLEMENTARY INFORMATION:

The purpose of this revision is to amend portions of the Federal Aviation Regulations (14 CFR Part 36) and amend references to specific rules of Part 36 in other parts (14 CFR Parts 21 and 25). This amendment is based on Notice No. 86-3 (51 FR 7878, March 6, 1986; Docket No. 24929) in which comments were invited. All comments received were fully considered in the issuance of this Final Rule.

SYNOPSIS OF THE PROPOSAL

Part 36 of the Federal Aviation Regulations (14 CFR Part 36) contains noise standards for aircraft type and airworthiness certificiation. As the part is currently organized, Subparts B and C and Appendices A, B, and C apply to transport category, large airplanes and subsonic turbojet powered airplanes regardless of type certification category; Appendix F contains the provisions applicable to propeller-driven small airplanes. This ammendment prescribes noise levels and test procedures for civil helicopters certificated in the normal, transport, and restricted categories; included are rules governing the issuance of original and amended type certificates for helicopters for which application is made on or after the adoption date of this amendment. The rule prohibits certain growth, or other design changes, if the changes are likely to result in noise levels above prescribed limits. The rule prescribes test conditions and procedures for conducting helicopter noise tests to demonstrate compliance with the prescribed noise levels, including the technical noise measurement and evaluation specifications, employing Effective Perceived Noise Level (EPNL) as the evaluation unit. The helicopter noise standards have the following effects:

Certification Procedures Provisions.

FAR Part 21, as amended, prescribes the procedural requirements for noise certification of civil helicopters certificated in the normal, transport, and restricted categories. These amendments apply to issuance of new type certificates in the normal, transport, or restricted categories for which application was made on or after the publication date of Notice 86-3. The effect of these provisions is to prohibit issuance of the affected certificates after the effective date of the amendments for helicopters which have not been shown to comply with the applicable noise requirements of Part 36. Thus, newly type certificated helicopters (except those for which application was made before the publication date of Notice 86-3) are required to comply with Part 36 noise standards. Further, the "acoustical change" provisions prescribe requirements that must be met to obtain approval of certain changes in type design of helicopters that may increase noise levels.

Appropriate references to Part 36 acoustical change requirements are contained in Part 21. The acoustical change rules for helicopters apply to any type design change, including operational limitations, that the Administrator determines may increase noise levels of that helicopter, such as changes in rotor size or trim, rpm, number of blades, weight or power. Under this amendment to Part 36, test procedures, conditions, and noise limits for acoustical changes are now prescribed.

Noise Standard Provisions.

FAR Part 36 is amended to prescribe noise standards for civil helicopters certificated in the normal, transport, and restricted categories. These provisions are similar to those currently applicable to other aircraft under Part 36 and are summarized as follows:

1. *General.*

The general provisions of Part 36, Subpart A, are amended to provide applicability, definitional, and acoustical change provisions covering civil helicopter noise certification. For example, the word "aircraft" is substituted for "airplane" in those provisions where the applicability simply would be expanded to include helicopters. Under this proposal, definitions identify two "stages" or levels of helicopter noise, "Stage 1" and "Stage 2". Stage 2 helicopters are those which have been shown to comply with the Stage 2 noise levels. Stage 1 helicopters are those which have not been shown to comply with Stage 2 levels.

A new section is added to prescribe noise requirements for those changes in type design defined as "acoustical changes" under FAR Part 21. Those provisions apply to acoustical change approvals applied for on and after the publication date of Notice 86-3. Specifically, no increase in any noise level (takeoff, flyover, or approach) is allowed after a change in the type design of a Stage 1 helicopter. For acoustical changes of Stage l helicopters, the tradeoff provisions can not be used to increase any Stage 1 noise level. A Stage 2 helicopter before a change in type design may not be a Stage 1 helicopter after the design change. It should be noted that the ICAO Annex 16 acoustical change standards applicable to Stage 1 helicopters are more stringent than those proposed herein that all helicopters must meet the complete Stage 2 limits after such a change.

The helicopter noise standards apply to all helicopters, as defined under FAR Part l, except those configurations designated *exclusively* for agricultural operations, the dispensing of fire fighting materials, or the transport of external loads. This exception is similar to the one for small propeller-driven airplanes, but is especially important for helicopters since nearly every type has provisions for at least occasionally carrying external loads. Such loads would make it extremely difficult to meet either the weight or performance requirements; thus, the noise standards only apply to internal load configurations. On the other hand, an exclusion of all helicopters with external load capability would defeat the entire purpose of the regulation. It should be noted that these standards are applicable to type certification actions for which applications are received on or after the publication date of Notice 86-3.

2. *Manuals, Markings, and Placards.*

The Part 36 provisions regarding requirements for operating limitations in manuals, marking, and placards under current Subpart G is redesignated as Subpart 0 and amended to extend their applicability by including approved Rotorcraft Flight Manuals, manual materials, or placards, as appropriate.

3. *Helicopter Noise Rule.*

A new Subpart H to Part 36 prescribes the basic requirements for demonstrating compliance with the helicopter noise rules. The technical standards, conditions, and procedures for conducting noise tests and the helicopter noise limits are presented in the Appendix H.

4. *Noise Measurement and Evaluation.*

The new Subpart H to Part 36 is a stand-alone document containing, among other things, the technical specifications for conducting and evaluating helicopter noise tests. With exceptions necessary to account for the unique operating characteristics of helicopters, the rule applies the specifications currently applicable to tests of transport category large airplanes and turbojet-powered airplanes under Appendices A and B of Part 36 (as amended by FAR Amendment 36-9, 43 FR 873, March 2, 1978, and as proposed in Notice 85-2, FR 4172, January 29, 1985).

Highlights of the differences for helicopter noise test under Appendix H and the requirements of Appendices A and B are summarized as follows:

a. Three noise test series are used: takeoff, flyover, and approach. Simultaneous noise measurements are made for each test series at a measuring station under the flight track and at two sideline measuring stations with one on each side of the flight track.

b. Helicopter height and lateral position from the noise measuring station are measured relative to the referenced flight path.

c. The approach angle for the helicopter approach noise test is 6° (±0.5°) rather than the 3.0° + 0.5° used for fixed wing aircraft.

d. Symbols and units appropriate to helicopter noise certification have been substituted for fixed wing aircraft noise symbols in section A36.7 "Flight Profile Identification Positions" and "Distance-Unit-Meaning" descriptors used in Part 36.

5. *Noise Levels.*

The new Appendix H to Part 36 contains helicopter noise levels for which compliance must be shown by actual flight tests. These levels include:

(1) "Stage 1" and "Stage 2" noise limits for each test series which are related to the maximum certificated takeoff weight of the helicopter; (2) tradeoff provisions which govern limited "exceedances" of noise levels for one or two tests series when such exceedances are offset by reductions in the noise levels of the other test series; and (3) separate test conditions for each of the three noise test series including airspeed, altitude, and operational profile over the noise measuring station, power, and helicopter position relative to the flight-track noise measuring station.

"Stage 1" noise limits include prohibition of noise level increases prescribed for "acoustical changes" of those helicopters which cannot achieve Stage 2 noise limits. These limits are prescribed separately for the takeoff, flyover, and approach tests series. Depending upon maximum certificated weights of the helicopter, maximum allowable noise levels are between 88 and 108 EPNdB for flyover, 90 and 110 EPNdB for approaches and 89 and 109 EPNdb for takeoff. The highest noise limit applies to maximum weights of 176,370 pounds or more. The noise limit is then reduced by 3.01 EPNdB for each halving of the maximum weight down to a maximum weight of 1,764 pounds.

Tradeoffs of any "exceedances" are limited to a sum not greater than 4 EPNdB with no single exceedances greater than 3 EPNdB; this is consistent with the ICAO standard. (For turbojet powered airplanes, the numbers are 3 and 2 EPNdB respectively.) The exceedances must be completely offset by noise levels below those required at the other two points. The noise level limits apply to helicopters of all weights, just as the noise level limits for other categories of aircraft are applied. However, no United States civil helicopters currently have maximum weights above 50,000 pounds.

This rule allows the first civil derivative of a military helicopter, including those operated by the U.S. Coast Guard, to be treated as though the military "parent" were a Stage 1 civil helicopter the noise levels of which are more than two dB decibels above the Stage 2 noise level limit. This has the effect of removing noise data requirement from the parent aircraft. Among the reasons for instituting this are: (1) lack of availability of noise level data for military aircraft and; (2) the costs associated with performing test on both versions.

6. *Applicability to current production types.*

As noted earlier, the rule is not applicable to helicopter types currently in production as long as an "acoustical change" is not made that may increase noise levels.

REGULATORY HISTORY

On December 28, 1973, the FAA published an Advanced Notice of Proposed Rulemaking (ANPRM) (Notice No. 73-32; 38 FR 35487) in which it announced that it was considering proposing noise standards for aircraft that were expected to be developed for efficient short stage length operations. It was anticipated that such a class of aircraft, referred to as "short-haul", would include aircraft having short, reduced, vertical or near vertical takeoff and landing capabilities. Since the noise technologies appropriate to those aircraft as a separate class required further study, original FAR Part 36 in 1969 did not prescribe separate rules for those aircraft; some, such as helicopters, were not covered by any regulation. Notice No. 73-32 (ANPRM) was issued as part of an additional study to invite early public participation in the identification and selection of a course, or alternative courses, of action to develop noise standards which would provide additional relief and protection to the public health and welfare from aircraft noise. On July 9, 1979, a Notice of Proposed Rulemaking (NPRM) Notice No. 79-13; (44 FR 42410) was published by the FAA. This notice proposed helicopter noise certification standards and limits on further production of older, noisier helicopter types. The procedures proposed for noise testing in NPRM 79-13 were similar, although not identical, to those proposed in Notice 86-3; however, the proposed noise level limits were significantly more stringent. Information submitted to the Docket indicated that the economic impact on the industry of limiting future production of existing helicopter types might be several hundred million dollars, due to the general unavailability of the noise abatement technology needed to meet the specified noise levels. After careful consideration of the economic impacts of the proposed rule and of the Docket comments on the effects of those impacts, Notice No. 79-13 was withdrawn (December 17, 1981; 46 FR 61486). At the time of withdrawal, the FAA stated that the action neither precluded consideration of similar proposals in the future nor committed the agency to any further or future course of action on this subject.

During the time since Notice No. 79-13 was withdrawn, the FAA has continued to study issues surrounding noise level certification of helicopters. One of such issue is the ICAO rule, contained in Annex 16, Chapter 8. The United States has been an active participant in modifications to that rule, including raising the allowable noise levels, with the aim of better balancing economic costs and environmental benefits.

As noted before the FAA has been studying issues surrounding noise level certification of helicopters since 1973. On March 6, 1986, a Notice of Proposed Rulemaking (NPRM) [Notice No. 86-3, 51 FR 7878] was published by the FAA, based on the comments and issues raised during this period. In addition, the NPRM provided for a commonality between U.S. standards and those adopted by ICAO. This rule revises portions of FAR 14 CFR Part 36 and amends references to Part 36 in other parts (14 CFR Parts 21 and 25) with the purpose of better balancing the economic costs and the environmental benefits.

AIRCRAFT NOISE RULES

Public Laws 90-411 and 92-574 were enacted to provide the statutory basis, under the Federal Aviation Act of 1958 (the Act), for relief and protection of the public health and welfare from noise and sonic boom from civil aircraft. Under the Act, the Administrator of the Federal Aviation Administration, after consultation with the Secretary of Transportation and the Administrator of the Environmental Protection Agency, is responsible for the adoption and amendment of rules which prescribe the necessary standards and regulations. On November 3, 1969, the Administrator adopted FAR Part 36 entitled "Noise Standards: Aircraft Type Certification" (34 FR 18355, November 18, 1969). That regulation initiated the FAA noise abatement regulatory program under the new statutory authority by prescribing noise type certification standards for subsonic turbojet powered airplanes regardless of category. Part 36 also prescribed the technical specifications for illustrating compliance with the noise level limits.

In promulgating proposals and amendments under the authority of § 611 of the Act, factors which the FAA must consider include the following:

1. Available data relating to aircraft noise, including results of research, development, testing, and related evaluation activities.

2. The appropriate views and position of other Federal, state and interstate agencies.

3. Whether the proposed regulations are consistent with safety in air commerce and air transportation and the public interest.

4. Whether proposed regulations are:

   a. Economically reasonable;
   b. Technologically practicable; and
   c. Appropriate for the particular type of aircraft, aircraft engines, appliances, or certificates to which they would apply.

5. The extent to which the proposed regulations contribute to providing protection to the public health and welfare by carrying out the purposes of § 611 of the Act. The overall environmental impacts of the regulations including environmental factors other than noise must be addressed in accordance with the National Environmental Policy Act of 1969, and implementing Federal guidelines and directives.

NEED FOR REGULATION

FAA data of the active rotorcraft fleet for 1985 shows 2,221 U.S. helicopter operators in the United States utilizing an active fleet of 6,412 helicopters. U.S. corporate/executive use of helicopters accounted for 1,391 aircraft and U.S. commercial helicopters accounted for 4,244 aircraft. The remainder of the fleet are comprised of emergency service aircraft. In 1984, there were 4,020 public use heliports and helistops in the United States. Approximately 9 percent of these heliports are rooftop facilities located in noise sensitive areas. The usage of helicopters is fully recognized in today's society.

For example, city ordinances in Chicago and Los Angeles require that buildings above a certain height be provided with rooftop emergency landing facilities for helicopters because modern fire-fighting apparatus cannot reach above eight floors. As other municipal governments recognize the need to provide increased protection for high-rise inhabitants, the number of heliports for both routine and emergency uses may increase significantly.

The growth of the civil helicopter fleet caused by the increased and more diversified use of helicopters, has intensified the demand for additional heliports. However, environmental concerns are imposing restrictions on heliport operations at an increasing rate. Environmental pressure has also forced closing of heliports with the resultant loss of helicopter services at those locations. The FAA believes that the adoption of appropriate helicopter noise standards will help protect the public by reducing helicopter noise and thereby maintain the benefits of their services in the air transportation system.

One of the key issues in the withdrawal of Notice 79-13 was the lack of effective noise abatement technology. To develop this technology, an accelerated joint research program was set up in 1982 by the National Aeronautics and Space Administration (NASA), the FAA, and American helicopter manufacturers. This National Rotorcraft Noise Research Program is a multi-year twenty-million dollar cooperative effort under the technical guidance of NASA and has two major goals: (1) development of noise abatement technology for reducing helicopter external noise levels and (2) the development of detailed parametric noise prediction techniques. This program is expected to furnish the technological basis for helicopter noise reduction into the twenty-first century and could significantly lower the cost of applications of that technology. At the conclusion of the program, the FAA will consider the appropriateness of lowering the certification noise levels for the helicopters; however, the FAA does not consider it appropriate, in light of the considerations listed in § 611 of the Act, to delay all rulemaking on noise standards for helicopters until the cooperative research program is completed.

The FAA has evaluated the helicopter as a noise source which affects persons and property and as a result concluded that it is now appropriate to adopt helicopter noise regulations necessary to protect the public health and welfare according to § 611 of the Act. This rule achieves that objective by preventing further escalation of helicopter noise levels and by laying the regulatory foundation for assuring that future helicopter types and eventually all newly produced helicopters of older type designs comply with realistic noise standards. The FAA has determined that sufficient noise control technology exists to meet the considerations of § 611(d) of the Act.

Economic aspects of this regulation are discussed in more detail in the rulemaking assessment prepared in conjunction with this rulemaking, and placed in the Docket. However, it should be noted that U.S. manufacturers of rotorcraft are already subject to the ICAO noise certification standards for each helicopter type that they wish to export. Since exports account for approximately 40 percent of the civil sales of U.S. helicopter manufacturers and, since the standards in this rule (except for "acoustical changes" of older, Stage 1 aircraft) are nearly identical to those of ICAO, only minimal cost impacts are expected from this standard. Offsetting these minimal costs are savings which will accrue to American manufacturers by one-time certification in the U.S. rather than certificating in each foreign country as necessary.

RULE STRUCTURE

As part of this rulemaking, certain portions of the current Part 36 were reorganized and restructed without any changes in their substance to improve their usefulnesss and understandability. The technical provisions of Appendices A & B, governing the measurement and evaluation of aircraft noise test data, which were referenced in Notice 86-3, were brought into Appendix H where appropriate. This was done in answer to several comments to the Docket citing confusion over the number and length of referenced sections.

REGULATORY IMPACT EVALUATION

The FAA conducted a detailed regulatory evaluation which is included in the regulatory docket and also reviews the changes to FAR Parts 21 and 36. The FAA determined that the rule is consistent with the objectives of Executive Order 12291 and does not impose an unnecessary or unreasonable regulatory burden on the private sector or on the public.

These amendments provide benefits that outweigh the costs of compliance. Specifically, the benefits are the greater acceptability of helicopters and heliports in urban environments and the attendant increased market for helicopters and helicopter services. Thus, the economic benefits accrue not only to the manufacturers and operators, but to the general public as well. The environmental benefits would accrue mainly to those working or residing near heliports, although some noise level improvements can be expected near helicopter flight corridors.

Costs result from increased development and certification expenses and are originally borne by the manufacturers but are expected to be passed on to helicopter operators and eventually to the public. These costs are mitigated by two factors: (1) the National Aeronautics and Space Administration has underway a joint helicopter noise reduction technology program with U.S. manufacturers and the FAA to improve the state-of-the-art and to lower the cost of application and (2) all helicopter models for export are required to comply with ICAO noise standards even if the U.S. were not to adopt the requirements contained in this rule.

REGULATORY FLEXIBILITY DETERMINATION

As detailed in the evaluation, the only cost associated with the changes to FAR Part 36 will be the cost to manufacturers related to the noise certification test. However, no domestic helicopter manufacturer is considered a small entity as is currently defined. Therefore, it is certified that the rule will not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

ENVIRONMENTAL ANALYSIS

Pursuant to the Department of Transportation "Policies and Procedures for Considering Environmental Impacts" (FAA Order 1050.lD), the FAA has determined that this rule does not constitute a major federal action significantly affecting the quality of the human environment. The amendment has the effect of limiting the growth of noise from new helicopter types and derivatives of existing types. This will reduce noise levels around heliports and, to some extent, under helicopter flight corridors, when compared to unconstrained growth. Little noticeable short-term general effect is expected, since it is estimated that it will take at least five years after adoption of the rule before a significant number of affected aircraft enter the nation's fleets. However, some helicopter operations and heliports are expected to be designed based upon the lower noise capabilities of newer aircraft, making site-specific improvements in the noise environment. Therefore, no environmental assessment or environmental impact statement was prepared.

TRADE IMPACT ANALYSIS

There will be little or no impact on U.S. or foreign trade from this rulemaking. Absent the rule, U.S. helicopter exports would have been placed at comparative cost disadvantage since each helicopter model still would be required to meet ICAO standards. The cost of multiple certifications would have resulted in either higher selling prices or lower profits to U.S. manufacturers.

DISCUSSION OF COMMENTS

Interested persons were afforded the opportunity to participate in development of this rulemaking by submitting written comments to the public regulatory docket on or before June 5, 1986. All comments received have been reviewed and duly considered in promulgating this amendment.

Sixteen public comments were received in response to the notice (Docket No. 24929). All of the commenters supported promulgation of noise certification standards for helicopters; however, each commenter also had specific suggestions about one or more of the FAA's proposed amendments.

The comments received in public Docket No. 24929 are discussed below. They are grouped by broad categories of issues.

1. *Flight Procedures*

Notice 86-3 proposed both flight test procedures and flight reference procedures. The first of these procedures gives instructions to the pilots so that the helicopters can be flown allowing realistic variations in weather, piloting techniques, and aircraft performance. The second specifies uniform flight path profiles so that the measured data may be compared to the standard. Several comments were received concerning the amount of variation in flight test techniques that the regulation should allow. Commenters explicitly stated that the rule should allow the helicopter operator to use a "normal" approach during the noise certification test. In addition, some comments claimed that noise data measured during normal approach differs significantly from noise measured under the constant six degree glide slope approach. They further stated that the certification flight test procedures should be used based upon practical "real-world" flight procedures rather than rigidly-prescribed procedures which are seldom used in service.

Much of the concern with flight procedures lies with their effect on the generation of the distinctive helicopter blade slap. Helicopter noise levels vary between models for different glide slopes. In 1979, the ICAO Committee on Aircraft Noise considered adding a blade slap correction to the calculation of EPNdB for helicopters. However, after extensive investigation, it was determined that the six degree approach would not unduly penalize any particular helicopter type.

Regarding the commenters' position, the development of alternative procedures was pursued by the FAA and the Helicopter Association International which was represented by both operators and manufacturers. However, experience showed that the versatility of helicopters was so great that there was often no single "real world" approach procedure. Conversely, redefining the procedures to allow applicants to choose any normal approach between three and nine degrees would result in an undesirable decrease in the stringency of the standard, unless the noise level limits were adjusted.

Furthere, it is noted that § 36.801 specifically allows certification noise measurements to be made using an FAA-approved equivalent procedure. This provision is intended to prevent hardships occurring as the result of the application of an inappropriate certification process.

Lastly, the FAA notes that the six degree approach glide slope has been adopted by ICAO in its helicopter noise certification standard and that both foreign and domestic manufacturers will have to certificate using six degrees, whether or not the United States adopts that procedure. The economic costs of developing and using a separate flight procedure specification that does not conform to the international standard are unjustified.

For the above mentioned reasons, the FAA is adopting the test and reference flight procedures as proposed.

2. *No-Correction Window*

The FAA solicited comments on the need for a "no-correction window", i.e., combinations of test and weather conditions that are so close to the standard reference conditions that no corrections to the measured test data are necessary. In response, several commenters expressed the opinion that the rule should have a "no-correction window". Their opinion was that a practical test "window" would limit the cost and complexity of the helicopter certification process.

The FAA believes that since most of the measurements have to be made either to make the corrections or to determine which measurements are inside the 'window", it serves little purpose to avoid making appropriate corrections. Cost savings, if any, would be negligble and would be far outweighed by the quality of the data available to the applicant. However, it is noted that the ICAO standard does not require corrections of reported noise levels for small variations from the reference conditions of flight path, airspeed, weight, ambient temperature, relative humidity, and rotor rpm for the takeoff and approach tests. Only the level flyover test does not have such a no-correction window. Because it would be unfair to require American helicopter manufacturers to bear disproportionately high costs, the FAA has determined to follow the lead of ICAO and allow small no-correction windows for takeoff and approach tests.

3. *Upper Bound Weight Limit*

The FAA requested comments with regard to establishing an appropriate upper bound to the noise versus weight standards. There are currently no American civil helicopters which have maximum weights above 50,000 pounds. Under Notice 86-3, the noise level limits for takeoff, approach, and sideline would vary with maximum takeoff gross weight. An earlier industry proposal would have the noise limits end at an upper weight of 56,000 pounds.

There were no comments in support of the 56,000 lb. limit. The manufacturers reported that there was no need for such a restriction at this time. One commenter objected to the proposal on the basis that it violated the ICAO agreements. The FAA has determined that there is no valid reason to enact a rule which would have the effect of creating a unique class of unregulated helicopters that would be at a distinct disadvantage on the export market. Therefore, this rule does not contain an upper weight limitation.

4. *Applicability to Current Production*

Notice 86-3 proposed establishing noise limits for new and derivative helicopter types, but did not propose to require compliance with the new noise standards as a condition for further production of current helicopter types. The FAA solicited comments on the appropriateness of this exclusion.

One commenter indicated that the industry had over seven years of notice of this rule. The commenter further indicated that industry consistently opposed the rule, even to the point of successfully arguing for the withdrawal of the original NPRM in 1982. He observed that all helicopters now in production meet the Stage 2 noise limit and, therefore, there is reason to establish a Stage 2 rule for all helicopters in production. This would assure that no Stage 1 helicopters would be produced. Another commenter recommended that the regulation be revised to set a date beyond which Stage 1 helicopters may no longer be introduced into the U.S. fleet. He was concerned that the rule almost ensures that excessively noisy helicopters will continue to be introduced into the fleet.

The FAA recognizes that most, if not all, of the civil helicopters in production were derived from military aircraft. The FAA believes that it would create an undue economic burden on the industry by requiring lower noise levels for which the military helicopters were originally designed. However, the FAA has a statutory responsibility to ensure that economically reasonable and technologically practicable noise limits are applied fairly and uniformly. The rules prohibit noise level increases from those helicopters which already cannot achieve Stage 2 noise levels before a change in type design. The rule would not allow a Stage 1 helicopter the noise levels of which exceed the Stage 2 noise limits by more than 2 EPNdB to grow in noise after the change in type design. Those Stage 1 helicopters the noise levels of which do not exceed the Stage 2 noise limits by more than 2 EPNdB may "grow up" to the plus 2 EPNdB limit. The FAA believes that this limited growth does not place undue restrictions on industry, but provides a realistic "cap" on the growth of helicopter noise impacts. Even though the rule allows helicopters currently in production to continue to be produced and added to the fleet, the fact still remains that all of the helicopters currently being produced meet Stage 2 limits. The FAA reserves the right to propose a new production rule that would restrict production to Stage 2 helicopters if and when it is warranted.

5. *Stringency*

One of the key issues in the public Docket was the stringency of the proposed noise level standards. Several commenters stated their belief that the noise level limits were not stringent enough and noted that the noise level standards were higher than those proposed in Notice 79-13 for both new helicopter types and derivatives. It was also noted that all helicopters currently in production would meet the standard, even though little or no effort had been made by their manufacturers to lower their noise levels. The opinion was expressed that the proposed rule would provide no real protection to the public.

The FAA generally agrees with the comments as far as they go. However, there is more to the issue of stringency than just the noise levels of current helicopters. After all, a certification regulation is actually applied to future aircraft types and to changes in existing types, not to aircraft already in service. In this case, the helicopters for which the regulation is intended are the next generation of high speed, high performance aircraft that will be introduced into service in the late 1980's and beyond. Current civil helicopters are largely derived from military versions. Accordingly, the missions for which they were designed have limited civilian application. However, the new helicopters are being designed for the speed and productivity demanded by a business-oriented economy.

From a technical point of view, new helicopters pose a greater noise control design challenge because the characteristics that would make a helicopter successful in the open market will also make it noisier. For instance, the increased speed and payload capabilities are largely the result of modern, high speed rotor design. As the rotor speed increases, the noise increases even more. As the payload increases, the rotor loading also increases and so does noise. Thus, the noise level limits will cap the noise to ensure that helicopters do not get noisier as new technology is introduced.

Some have suggested that the FAA should now place a cap on the noise levels with the intention to lower the permissible noise by 3 to 5 decibels in a specific time, possibly five years. The FAA believes that such a suggestion is premature, as NASA and the U.S. industry have an extensive research program under way to provide the tools needed to design and evaluate effective noise abatement technology for new type design helicopters. At the conclusion of the NASA program, the FAA will consider the appropriateness of lowering the noise certfication levels of helicopters. Lastly, the standards in this rule are identical to ICAO's standards which industry must meet to maintain its export market and which foreign-made helicopters must also meet.

6. *Test Costs*

Several commenters were of the opinion that the complexity of the rule, especially the requirement for correcting the data if the test is performed outside of the "no-correction window," is too costly. For certain helicopter models, the sales are in such small quantities and at such irregular intervals, that a requirement to perform extensive and costly noise certfication testing could lead to discontinuing the sales, despite the fact that the helicopter as measured by the FAA meets the noise limits. A commenter stated that because fewer commercial helicopters are being manufactured, the cost of any design modification must be absorbed by these few, increasing the per-unit cost, which is ultimately passed on to the consumer. If sales decrease substantially, the per-unit cost becomes so high as to be totally impractical and the design is no longer profitable. One commenter indicated that the cost of certificating a helicopter to the noise standards in the rule would be approximately $500,000, which exceeds the costs of some helicopters by as much as a factor of ten.

The cost as cited above is unsubstantiated and the FAA estimates the costs to range between $5,000 to $50,000, depending largely on the manner in which the helicopter flight time was billed. Standardization of the FAA and ICAO test procedures should provide further savings. The issue of the complexity of the rule regarding a "no-correction window" resulting in extra cost is not supported. As indicated previously, the manufacturer would be required to make most of the measurements anyway to determine whether the data had to be corrected. The extra cost to adjust the data to a given standard is negligible with today's microcomputers.

7. *Other Issues*

Commenters to the Docket raised a number of other technical and editorial issues. One industry group observed that the rule as proposed in Notice 86-3 was difficult to follow because it repeatedly referenced other sections of FAR Part 36. This was especially noted in those sections which specified acoustical and meteorological instrumentation and correction procedures. Several comments were also received about the organization of Appendix H and about the perceived need to reorganize it more along functional lines. The FAA agrees with these suggestions and has brought into Appendix H most of the materials that were referenced in the Notice. The one major exception to this process is that the definition of the noise metric, Effective Perceived Noise Level (EPNL) and the procedures for computing it, remain solely in Appendix B. This arrangement will insure that the EPNL used for each aircraft category remains consistent with that used for any other category. Any modifications to the basic formulations will automatically apply to all categories.

The contents of Appendix H have been reorganized to make them clearer and easier to follow. The new Table of Contents is at the beginning of the appendix. Typographical mistakes that appeared in the Notice have been corrected. In addition, several minor changes to the test specifications have been made to incorporate test tolerances that correspond to ICAO values and to incoporate metric equivalents where they had been inadvertently omitted.

THE AMENDMENT

Accordingly, the Federal Aviation Administration amends Parts 21 and 36 of the Federal Aviation Regulations (14 CFR Parts 21 and 36) effective February 5, 1988.

The authority citation for Part 21 continues to read as follows:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2); 42 U.S.C. 1857f-10, 4321 et seq.; E.0. 11514; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

Amendment 21-62

Standards Governing the Noise Certification of Aircraft

Adopted: April 14, 1988 **Effective: May 6, 1988**

(Published in 53 FR 16360, May 6, 1988)

SUMMARY: This final rule revises certain provisions of the regulations prescribing requirements for aircraft noise certification to make them more understandable and easier to use. This amendment also contains substantive regulatory changes simplifying noise certification test and recordkeeping requirements. This regulation is part of the President's regulatory reform program and is based on the body of good engineering practice that has developed since the original adoption of Part 36 in 1969. It also reflects comments received from the general public and the aviation industry in response to a Petition for Rulemaking from the Aerospace Industries Association of America and to an FAA Notice of Proposed Rulemaking.

FOR FURTHER INFORMATION CONTACT:

Mr. Harvey VanWyen, Noise Policy and Regulatory Branch (AEE-110), Noise Abatement Division, Office of Environment and Energy, Federal Aviation Administration, 800 Independence Ave., SW, Washington, DC 20591, Telephone (202) 267-3558.

SUPPLEMENTARY INFORMATION:

The purpose of this revision is to amend portions of the Federal Aviation Regulations (14 CFR Part 36) and amend references to Part 36 contained in other parts (14 CFR Parts 21 and 25). This amendment is based on Notice No. 85-2 (50 FR 4172, January 29, 1985). Comments were invited. All comments have been received and considered in the issuance of this final rule.

SYNOPSIS OF THE PROPOSAL:

Part 36 of the Federal Aviation Regulation (14 CFR Part 36) contains noise standards for aircraft type and airworthiness certification. As the part is currently organized, Subparts B and C and Appendices A, B, and C apply in part to transport category large airplanes and subsonic turbojet powered airplanes regardless of category. This amendment revises these sections of the part to better reflect the actual technical basis for noise certification of aircraft. Substantive changes are made in the noise certification testing, recordkeeping and reporting requirements. The Federal Aviation Administration (FAA) has found that while there will be a substantial cost reduction realized as a result of these changes, there will be no net increase or decrease in noise standard compliance stringency for any class of aircraft. Further, this amendment will not result in any increase or decrease in aircraft noise levels.

Changes in Test Requirements

This amendment to the noise certification test requirements is intended to simplify the noise test procedures, to clarify the purpose of the tests, to update equipment specifications to better accommodate the use of modern digital electronics, and to further reduce the number of flight tests conducted solely for approval of relatively minor aircraft modifications. One such change involves decreasing from four to two the minimum number of sideline noise measuring stations which are used to define the maximum sideline noise. By placing the remaining microphones on either side of the point where the jet aircraft reaches 1000 feet or 1440 feet altitude (AGL), the maximum aircraft noise can be accurately determined at significantly lower costs for equipment, installation, calibration, and data reduction.

Similarly, relative humidity and wind limits on test conditions are eased to maximize available test sites and usable days at those sites. The humidity limit is increased for those applicants using higher precision instruments, while the wind limit increase is based on wide industry/government experience. The requirement which specifies the location of the meteorological instrumentation is clarified to require that the weather be measured in the vicinity of the noise measuring stations, rather than at the nearest airport.

A number of technical amendments to the analyzer specifications and to the data reporting requirements are adopted to facilitate the use of a wider variety of instrumentation, particularly the newer digital analyzers. Further, because recent computer processing advances make it possible to use data closer to the ambient noise floor and, in some cases, to reconstruct data where parts of the spectrum are below the ambient, greater flexibility is provided to the FAA in approving test and analysis procedures.

One of the major purposes of this amendment is to provide clearer guidelines on the use of nonflight, supplemental tests to meet Part 36 certification requirements. The cost of noise certification of a single jet aircraft type often runs from several hundred thousand dollars to well over a million. Where a long production run of a complex and sophisticated aircraft is anticipated, this cost is generally insignificant when compared to the total development cost of the project. However, to meet the increasingly competitive nature of aviation in this decade, aircraft manufacturers have shortened production runs of standard models and now produce families of related short production run versions. This revision will make it easier to collect a flight data base of sufficient quality and breadth from the first aircraft in such a family so that other related aircraft can be noise certificated using that data base, supplemented by only relatively simple and inexpensive tests and analyses. For instance, noise data from static tests conducted at either the engine or aircraft manufacturer's ground facilities may be approved, as appropriate, by FAA certificating authorities.

Changes in Documentation Requirements

The documentation requirements placed on industry and on individual applicants are reduced as a result of this amendment. These changes will result in lower expenditures in manpower and effort by the government in the review and approval of noise certification documents.

The elimination of certain requirements for prior FAA approval of test procedures greatly simplify the paperwork prior to the test, as well as simplify the test itself. As amended, Part 36 retains the requirement for an approved test plan, albeit a simpler one. Similarly, the certification report requirement which contains the engineering data supporting the certification also remains.

Reduction of the post-certification paperwork, however, is where this amendment works its greatest effect. Previously, Part 36 required that each Airplane Flight Manual (AFM) must contain all procedures that are employed in the flight test, the certificated noise levels, any weight limitations that were required to meet the noise level requirements, and "other information for the flight crew." While this did not appear to be an onerous burden at the time the original Part 36 was adopted, the FAA has found a number of situations where these seemingly simple requirements have resulted in a distortion of the AFM functions. Several large commercial jet aircraft types have been certificated with hundreds of different versions within each type. As a result, the AFMs contain hundreds of pages of noise "information." Under these circumstances, it becomes extremely difficult to identify which data are applicable to any particular airplane on a given day.

The AFM is a required document providing on-board information necessary for the flight crew. It contains specific aircraft performance data, flight procedures, and aircraft limitations vital to the safe operation of the airplane. As indicated above, noise information is also included. However, after careful consideration, the FAA found that it was appropriate to greatly reduce and simplify the noise portion of the manual. Aircraft weight limits or operating configurations required to meet Part 36 certification will continue to be placed in the limitations section of the AFM. However, beyond this, the FAA feels that only the minimum information necessary to obtain a Part 36 compliance statement and the takeoff, approach, and sideline noise levels for that specific airplane configuration is needed. Thus, the FAA clarifies Parts 25 and 36 to preclude the inclusion of inappropriate information in the AFM.

Other Changes

The acoustical change provisions of Part 21 are clarified by specifically excepting from the noise certification requirements several temporary configurations and conditions used for maintenance. Since none of these conditions represents the permanent configuration of any aircraft type, the FAA finds that this action is consistent with Section 611 of the Federal Aviation Act (as amended).

Numerous references to obsolete dates and conditions are removed to shorten and simplify Part 36 while several sections have been retitled more appropriately.

REGULATORY HISTORY

Since its adoption in November 1969, FAR Part 36 has been a significant basis for all Federal aircraft noise regulations in the United States. That regulation was structured to provide a firm, consistent foundation for subsequent rulemaking activities to abate and control aircraft noise.

Part 36 includes precise instructions concerning the acquisition, processing, and documentation of noise data from inflight aircraft. As originally promulgated, Part 36 applied only to turbojet aircraft and propeller-driven transport category airplanes over 12,500 pounds maximum gross weight.

Amendment 36-4 (40 FR 1029, January 6, 1975) added noise certification standards for propeller-driven small airplanes. The noise level limits for certain new turbojets and transport category airplanes were lowered in 1977 by Amendment 36-7 (42 FR 12360, March 3, 1977). In 1978, these lower noise level standards were applied to derivatives of older aircraft types. Noise standards for Concorde supersonic transport airplanes were also adopted in 1978 by Amendment 36-10 (43 FR 28406, June 29, 1978).

Amendment 36-9 (43 FR 873, March 2, 1978), which was adopted in 1978, widely revised the test and analysis specifications contained in Appendices A and B of Part 36. The specifications were expanded to include technical details that had been omitted from the original publication. An example of this was the addition of a section on the calibration of acoustical test equipment. Other changes were made to bring FAR Part 36 into substantial agreement with international standards on noise measurement and with the procedures adopted for noise certification by the International Civil Aviation Organization (ICAO).

The FAA published (47 FR 47854, October 28, 1982) for public comment, a petition from the Aerospace Industries Association of America (AIA) on behalf of its member aircraft manufacturers for amendment of FAR Parts 21 and 36. Notice No. 85-2 (50 FR 4172, January 29, 1985) contained a summary of the comments submitted to the Docket in response to the petition, and the disposition of the issues raised. Notice No. 85-2 also proposed 41 specific changes to Part 36. A discussion of docketed comments on those proposals and the disposition of the issues follow.

DISCUSSION OF COMMENTS

Interested persons have been afforded the opportunity to participate in development of all aspects of this rulemaking by submitting written comments to the public regulatory docket. The period for submitting comments closed April 4, 1985. All comments received have been reviewed and considered in the issuance of this final rule.

Thirteen public comments were received in response to the notice (Docket No. 23340). All of the commenters supported the stated goals and most of the 41 proposed amendments. In addition, nearly every response contained specific suggestions or recommendations about one or more issues.

The comments are discussed below. They are grouped by broad categories of issues.

Acoustical Change

Meeting the noise requirements of Part 36 is one of the steps in the certification approval process for any change to an already certificated aircraft. Included are changes to the aircraft type design which might affect the noise emission characteristics of the aircraft. The definition of acoustical change and the requirement to meet Part 36 standards for design changes within that definition are in Part 21. In Notice 85-2, the FAA proposed to exempt from the definition of acoustical change for turbojet aircraft and transport category large aircraft configured for (a) gear down flight with one or more retractable landing gear down during the entire flight and (b) carriage of a spare engine and nacelle carriage external to the skin of the airplane (and just the pylon or other external mount).

Only two comments were received on this issue. Both supported the proposed change as reasonable and necessary. The FAA agrees and is adopting the modification as proposed.

Aircraft Flight Manual

Over the past several years, there has been some concern that the aircraft operational limits, if any, that are established as a result of FAR 36 noise certification are not being expressed properly in the Aircraft Flight Manual (AFM) when promulgated with reference to the airworthiness limitations. To clarify the intent of the existing regulations, Notice No. 85-2 proposed to add clarifying language in Part 25 (where additional AFM requirements are listed) and in Part 36.

Section 25.25(a) clarifies that the maximum gross weight which meets the noise requirements of Part 36 limits the maximum certification weight. One of the two commenters supported the clarification; the other, a large trade association, reported that some members were opposed while others were favorable. The FAA notes that this provision does not change the regulatory requirement, but simply clarifies the Part 25 certification process by expressly referencing the weight certification requirements of Part 36. The FAA, therefore, is adopting this clarification.

Similarly, Notice No. 85-2 proposed to clarify the definition of Stage 1, Stage 2, and Stage 3 airplanes by categorically stating that each airplane can only be classified in one stage given a specific configuration.

Five commenters responded on this issue. All were opposed to the specific wording proposed for § 36.1(g) because, in their opinion, the words could be interpreted as requiring each airplane to remain within one Part 36 stage. However, none of the commenters appeared to object to the stated intent of the proposal and several suggested small changes in the regulatory language to eliminate the problem.

For more than a decade, the FAA has both encouraged and required the application of available noise reduction technology. The goal has been to move Stage 1 aircraft into Stage 2 and Stage 2 aircraft into Stage 3. In most cases, this has been done voluntarily without the need for regulation. The FAA does not intend to inhibit such actions. Therefore, in light of the comments, the FAA has decided to accept the suggestion of one commenter that the regulation should more clearly indicate that an airplane may not be certified to two stages simultaneously or that an airplane may not, without a change in type design configuration, comply with one stage and then another. Further, it should be noted that current regulations clearly prohibit Stage 2 or Stage 3 aircraft from becoming Stage 1 aircraft.

Notice No. 85-2 also proposed three minor changes in § 36.1581 to clarify that the AFM allows only one certification noise value each for takeoff, approach, and sideline. Since, for flight safety reasons, the AFM on board any airplane may only describe the one current certificated configuration for that airplane, the present rules only require the AFM to have the noise information for that one configuration. As noted in Notice 85-2, the lack of clarity in the Federal Aviation Regulations has caused some manuals to contain detailed noise information on dozens and possibly hundreds of different configurations. The AFM, however, is basically a flight safety document containing vital information for the pilot and crew. While it was determined more than 15 years ago that it would serve a legitimate and useful purpose for the AFM to contain limited noise information, it never was intended for the AFM to become a noise primer on every possible variation in noise levels that might result from changes in configuration, operating procedure, or weather conditions. Thus, Notice 85-2 proposed to consolidate the existing regulations that affect the selection of noise data for the AFM and eliminate the requirement for noise certification test procedures to be included.

Seven comments were received on the proposed amendments to § 36.1581. All agreed with the need to reduce the volume of noise information in the AFMs and with the proposal to eliminate the requirement for noise certification test procedure documentation. Several commenters expressed concern that the FAA's proposed language would limit the use of several "configurations" that have been approved for both safety and noise. The FAA cannot agree.

An airplane is a versatile machine. In most cases, it is designed and built so that it may be operated with different combinations of weight, speed, flap settings, engine power setting, etc. Combinations of these parameters are optimized by the manufacturer for different missions (range payload, speed, weather, runway length, etc.). Each combination is called a configuration. Each configuration, in turn, has clearly stated operating limits involving various parameters. These limits are set by the airplane's manufacturer on the basis of safety. Occasionally, these limits may be further restricted by the manufacturer to lower the noise level of the airplane. The FAA oversees this process on each configuration of every airplane type, maintaining first the highest degree of safety. The FAA's approval is called certification. As a part of this certification, the FAA approves the manufacturer's AFM which contains detailed information needed by the pilot and crew to safely operate the airplane within the limitations of one configuration.

An airline or other operator may purchase from the manufacturer the right to use several different configurations of the same airplane. However, for safety reasons it is vital that the pilot and crew know the limitations applicable to the specific configuration that they are flying that day. Thus, FAA safety rules require each AFM to describe only one configuration at any point in time, no matter how many other configurations the manufacturer has sold to the operator. The proposed changes to § 36.1581 would not change this; they would only restate the existing airworthiness requirement in that portion of Part 36 which deals with AFM information. The FAA believes that this is necessary to avoid confusion. For that reason, the proposed amendments to § 36.1581 are adopted.

Obsolete Dates and Conditions

Numerous references to dates and conditions that are no longer pertinent to present and future applicants for type certification were proposed for removal under Notice No. 85-2. All commenters to the docket endorsed this activity. Three, however, had comments on specific proposed deletions. A U.S. trade association suggested that "(except as provided in § 36.7)" be inserted in § 36.201(b) after the words "type certifications." The FAA does not agree and the language as proposed in the Notice is adopted.

A British trade association and a British manufacturer submitted identical comments suggesting deletion of the provisions, contained in § 36.7(d), which use the engine bypass ratio in determining which provisions apply to applications for "acoustical changes". The FAA agrees that § 36.7(d) should be simplified and shortened. However, the FAA also believes that implementation of this specific suggestion would be neither economically reasonable nor technologically practicable. The differing technologies available to high and low bypass ratio engines require different treatment under the regulation. Thus, the FAA believes that implementation of this suggestion would have the effect of restricting the applicability of Part 36 to new type designs and to the first few derivative configurations. Since adoption of this restriction would prevent the FAA from complying with the intent of Part 36, the FAA declines to accept the suggestion.

Certification Reports

Sections 36.1501 and A36.5 contain the documentation requirements for technical data reports on certification tests and results. Notice 85-2 proposed to clarify the required information and further proposed to specifically allow inclusion of data from supplemental test (such as ground-based static tests of engines). This increased flexibility would allow wider use of cost-saving equivalent procedures as long as the data could be analyzed to yield results that would be equivalent to the results of actual aircraft flight tests.

Only one comment was received on the proposed change to § 36.1501. The commenter opposed the use of "equivalant procedures" such as ground-based static engine tests since such tests by themselves would not be a true measure of the noise increments experienced from an engine change. The commenter states that such changes are often accompanied by changes in nacelles, wing design, fuselage length, and gross weight. The FAA, on the basis of experience, agrees with the reasoning but does not agree with the conclusion. No equivalent procedure has ever been approved (nor would it be under the revised text) under the conditions described where the only supplemental data are those derived from static engine testing. All acoustical and performance data used to develop noise certification levels are based on actual flight tests. The supplemental tests which would be documented under sections 36.1501 and A36.5 are only used to make adjustments to the flight data where it can be shown that there are no other changes to the noise sources, including their relative contributions to the total noise signature. Supplemental flight data or a totally new flight data base might be necessary to derive the noise level numbers under the cited conditions. For these reasons, and because the proposed change would not affect the approval of equivalent procedures but only the test documentation, the FAA disagrees and adopts the language proposed in the Notice.

Two comments were received on the proposed change to § A36.5. Both suggested the inclusion of "appropriate propeller powered aircraft performance parameters relevant to noise generation." While the FAA believes this suggestion may be valuable, its inclusion would be outside the scope of Notice 85-2. The FAA will consider including this concept in future rulemaking.

One commenter also noted that the wording of the proposed revision to § A36.5(b)(5)(vii) would remove the requirement for aircraft height and position data independent of normal flight instrumentation. Since this is a key part of ICAO certification, adoption of the proposed wording could have the effect of invalidating international acceptance of U.S. certifications, along with the attendant economic consequences. The FAA did not intend to remove the requirement for independent height and position data, but agrees that the proposed wording would have that effect. Consequently, the FAA has decided not to adopt the proposed revision of that section.

Test Procedures

Notice 85-2 proposed nine separate changes in the Part 36 noise certification test procedures. In each case, the intent of the proposed change was to lower the cost of certification without significantly diluting the quality of the noise data used for certification.

Seven comments were received on the proposed changes to § A36.1(b). All supported the proposed simplifications, although one commenter expressed concern with regard to the FAA's credibility in administering the noise certification process. It should be noted that the FAA continues its commitment to a strong noise regulatory structure. To this end, the FAA has reviewed these procedures with national and international experts and remains confident that the noise certification process will remain intact and effective. Simplification and cost savings are not being purchased by a decrease in stringency or thoroughness.

In response to a British suggestion, the word "height" is substituted for "altitude" in section A36.1(b)(7) to signify the airplane's height above the local terrain containing the noise measuring sites. Similarly, a test tolerance (500 to 0 ft.) on this height is inserted, because without such a tolerance the airplane would be required to make every test flight 1000 or 1440 ft. above the terrain.

Notice 85-2 proposed to require more accurate measurements of ambient temperature and relative humidity. It also establishes a higher upper limit average wind speed for the microphone and a higher limit crosswind speed average for the aircraft. It also proposed to increase the upper limit average wind speed from 10 knots to 12 knots for the instrumentation and the acceptable crosswind speed for the microphone from 5 knots to 7 knots. The maximum wind speed cannot exceed 15 knots for the instrumentation and 10 knots for the crosswind. The Notice also proposed to clarify that the meteorological variables should be measured in the vicinity of the noise monitors. Widening these weather windows would lower costs to both industry and government by minimizing delays which presently tie up equipment, aircraft, and personnel for days while waiting for specific weather conditions. Five comments were received. One supported the proposal, one wanted to remove all test weather limits under certain conditions, and three foreign organizations objected because of the belief that the Notice proposed maximum winds of 15 knots and crosswind limits of 10 knots. They suggested use of the ICAO limits, 12 and 7 knots, respectively. However, the FAA notes that Notice 85-2 did, indeed, propose the ICAO values of 12 and 7 knots for the upper average limits while also setting maximum values. Therefore, the FAA adopts the proposed revisions.

A number of changes were proposed in the technical specifications for the electronic equipment used in the collection and analysis of the noise data. These changes generally follow the standards adopted by the ICAO and should minimize costs where manufacturers have to certificate to both ICAO and U.S. standards.

Eight comments were received on the proposed revisions to the microphone specifications. Most were general comments on the need to duplicate the ICAO specifications. One specific comment noted that the wording of the last sentence of section A36.3(c)(2)(ii) varied somewhat from the ICAO standard and that this difference would cause applicants difficulty. After considering the issue, the FAA agrees and the amended specification is adopted with the suggested change.

The FAA also proposed to revise the electronic specifications for the noise analyzer. Earlier specifications were based on the analog system used a decade ago. Notice 85-2 proposed, instead, to update this section, based on the digital equipment currently in use. Since ICAO has not yet adopted similar revisions, most of the seven commenters recommended delaying adoption. However, the FAA believes that the problems encountered by both applicants and government in trying to qualify digital systems under analog specifications require the FAA to act. Thus, the proposed revision to section A36.3(d) is adopted. However, should ICAO eventually adopt differing specifications, it is the intention of the FAA to issue a subsequent notice proposing adoption of the ICAO standard in the U.S. In adopting section A36.3(d)(5)(i), the FAA also corrects a typographical error that appeared in the Notice. The correct standard deviation is 0.48 decibels.

Data Correction and Analysis

Notice 85-2 proposed to amend section A36.5 to clarify the information that is needed to correct the data to standard reference conditions in that the referenced atmosphere should be considered to be homogeneous. Specifically, only those engine performance parameters relevant to noise generation, such as net thrust, engine pressure ratio, exhaust temperatures, and fan or compressor rotational speeds, would be reported. Aircraft sound pressure levels need to exceed the ambient background by only 3 decibels instead of the present 5 decibels. The Notice proposed to allow lower signal-to-noise ratios if the method for separating the signal from the noise is approved by the FAA. Several other amendments to Appendices A and B of FAR 36 were proposed that would make relatively minor changes to mathematical constants in the correction procedures or that would make minor revisions in the description of the procedures. These were considered to be clarifying, not substantive, even when the amount of data to be reported was reduced.

Seven of the commenters responded to these proposed changes with suggestions for improving the clarity of the revisions. These minor typographical suggestions have been incorporated.

Other Comments

Several respondents to the docket took the opportunity to make suggestions for additional changes and modifications outside the scope of Notice 85-2. Even though some of these comments appear to have merit, the FAA does not believe their cumulative value justifies a delay in issuing this final rule in order to issue a supplemental NPRM.

SECTION-BY-SECTION ANALYSIS

Part 21

Section 21.93 prescribes the procedural requirements for the approval of changes in type design that may increase the noise levels of an airplane type. Paragraph (b)(2) is amended to add an exclusion for gear down flight with one or more retractable landing gear down during the entire flight and for spare engine and nacelle carriage external to the airplane skin (and the return of the pylon or other external mount).

Part 25

Section 25.25 contains the criteria upon which the maximum weight of an aircraft is based. This section is clarified to note that the highest weight at which compliance is shown with the certification requirements of Part 36 may be, under some circumstances, the limiting maximum weight.

Part 36

The last sentence of § 36.7(c)(1) is amended to clarify that Part 36 noise tradeoff provisions may not be used to increase non-complying Stage 1 noise levels. The Part 36 tradeoff provisions can be used, however, once the modified airplane qualifies as a complying Stage 2 airplane. This could occur, for instance, when the aircraft increase in weight raised the allowable Stage 2 limit by more than the measured increase in noise.

Sections 36.7(d) and (e) and 36.301(b) are revised to remove obsolete language, dates, and references. Sections 36.201(c) and (d) are deleted for similar reasons.

Section 36.1501 is expanded to clarify the need for approval of equivalent procedures and to allow wider flexibility in the use of non-flight test data to supplement approved flight data bases.

Two subparagraphs are added to § 36.1581(a) to clarify that only one value for each noise certification test point for takeoff, sideline, and approach as defined by Appendix C may be placed in the Aircraft Flight Manual, along with associated weight and configuration. Similarly, one value for flyover as defined by Appendix F for propeller driven small airplanes may be placed in the Aircraft Flight Manual. If additional operational noise information is included in the Aircraft Flight Manual, it must be segregated from the certification data in accordance with § 36.1581(b). The old § 36.1581(c) is reworded to clarify its intent and redesignated as (d).

Appendix A of Part 36

Section A36.1(b) is revised to allow flight path intercept tests, rather than requiring only full stop takeoffs and landings for every test. This section is also amended to allow a minimum of two symmetrically-placed microphones to measure the sideline noise rather than the minimum of four currently required. Both changes are expected to provide wider flexibility in the choice of test sites and to significantly lower the cost of such tests.

Section A36.1 is revised to expand the flight test weather window when the dew point and dry bulb temperature are measured with an instrument accurate to within one-half degree Centigrade. The allowable winds during the test are increased to those specified in ICAO Annex 16. The requirements to generate noise level versus weight information for takeoff and approach are deleted.

A number of the technical specifications in section A36.3 are revised to accommodate the use of digital recording and filtering techniques. Section A36.3(e)(7) is revised to require a performance calibration analysis of each piece of calibration equipment at least once every six months.

Section A36.5 contains the requirements on reporting and correcting measured data. Section A36.5(b) is revised to eliminate the need to obtain engine performance data solely from flight instrumentation or manufacturer's data. By this revision, static tests and other sources of supplemental data can be employed. Section A36.5(c) is also amended to indicate that the noise certification atmosphere is homogeneous. That section is also amended to replace an erroneous reference to "design" landing weight with the correct reference to "maximum," landing weight.

Section A36.5(d) is amended to accept one-third octave band data that are at least 3 decibels above the mean background noise in that band. Before this amendment, the data had to be least 5 decibels above ambient. This change permits greater flexibility in the choice of test conditions and is particularly necessary for the test of quiet airplanes. Greater flexibility is also provided by the approved use of time/frequency interpolation and equivalent procedures within the indicated limits.

Section A36.5(e) is revised to add a new paragraph (4) which specifically allows the orderly development of noise certification for certain derivatives of aircraft type design, and provides simplified methods for computing the 90 percent confidence limits for those derivatives.

The requirements in section A36.9(b) for locating meteorological measurements have been changed to permit their placement near the measuring stations, rather than using meteorological data from the nearest airport. This is intended to improve the quality of the meteorological data in those cases where the flight tests are not conducted at an airport. Another change to the meteorological specifications is made in section A36.9(d)(2) where the criterion for using the simplified method for deriving the values of the atmospheric coefficients has been broadened. Accordingly, the simplified method may be used if the atmospheric absorption coefficients do not vary over the sound propagation path of the maximum noise by more than plus or minus 1.6 decibels per thousand feet in the 3150 Hertz one-third octave band.

Section A36.11(a)(3)(v) is amended to delete the requirement for graphical or tabular data presentations during data correction. These corrections may not be done by computer or other appropriate means.

Several small corrections are made to section A36.11(e). One updates a cross-reference to sections A36.11(b) and (c), while the others correct a mathematical constant used in the Delta 2 calculations for takeoff, approach and sidelines.

Section A36.11(f) is completely revised and considerably shortened to provide clearer guidance or appropriate correction procedures when the takeoff and/or approach noise measurements are made at non-standard locations. Two alternative methods are provided.

Appendix B of Part 36

Section B36.5(h) and Table B-2 are revised to eliminate calculation of tone penalties for tones less than 1.5 decibels.

Sections B36.9, B36.11, and B36.13 contain the technical and mathematical details of the methods for calculating Effective Perceived Noise Levels (EPNL). Several small changes are made in the formulation to simplify the computerized procedure.

Appendix C of Part 36

Sections C36.5(c), C36.7(d), and C36.9(d) are deleted as unnecessary and the subsequent sections are redesignated accordingly. Sections C36.7 and C36.9 are retitled to better describe their functions.

REGULATORY IMPACT EVALUATION

The FAA conducted a detailed regulatory evaluation which is included in the regulatory docket. This evaluation assesses the economic impact of all changes to Parts 21, 25, and 36. The FAA has determined that this rule is consistent with the objectives of Executive Order 12291 as part of the President's Regulatory Reform Program to reduce regulatory burdens on the public. This rule imposes no additional costs on the Federal government.

The amendments in this rule will provide benefits in the aggregate to the aviation industry and the general public. These benefits arise from deletion of unnecessary noise certification testing and recordkeeping requirements, clarification of regulatory text, and relaxation of certain test and documentation requirements. The amendments better reflect new technologies and consequently many amendments are clarifying and editorial in nature. As an overall result of these amendments, the regulations are more concise and easier to understand. None of the amendments are expected to result in a major cost to the aviation industry. There are 10 amendments which are expected to yield minimal to minor benefits and three amendments are expected to result in minimal to minor costs. One of the amendments which will reduce from 4 to 2 the number of sideline measurement stations needed as part of the aircraft noise certification process is estimated to save manufacturers approximately $2.0 million discounted over a 10 year period. For the reasons stated above, the benefits flowing from these amendments substantially outweigh any associated costs.

REGULATORY FLEXIBILITY DETERMINATION

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by government regulations. The RFA requires government agencies to review rules which may have a "significant economic impact on a substantial number of small entities."

These amendments directly impact large manufacturers of aircraft. The FAA size threshold for a determination of a small entity for aircraft manufacturers is 75 employees; that is, any aircraft manufacturer with more than 75 employees is considered not to be a small entity. Based upon this size threshold, the aircraft manufacturers affected by this rule are not small entities. Moreover, of the potential cost impacts, three require minimal computer programing changes which can be accomplished in-house. One of the amendments is estimated to save the manufacturers approximately $2.0 million. The remaining changes are editorial in nature. This rule will not have any significant economic impact.

Therefore, the FAA certifies, this rule will not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

ENVIRONMENTAL ANALYSIS

Pursuant to Department of Transportation "Policies and Procedures for Considering Environmental Impacts" (FAA Order 1050.1D), a Finding of No Significant Impact has been made. These amendments are primarily administrative, clarifying and organizational, and do not significantly affect the quality of the human environment.

CONCLUSION

For the reasons stated above, the FAA has determined that this document involves a regulation which is not major as defined in Executive Order 12291 and not significant under Department of Transportation Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). In addition, the FAA certifies that under the criteria of the Regulatory Flexibility Act this final rule will not have a significant economic impact on a substantial number of small entities. A copy of the regulatory evaluation may be examined in the regulatory docket or obtained by contacting the person identified under the caption "FOR FURTHER INFORMATION CONTACT."

THE FINAL RULE

Accordingly, the Federal Aviation Regulations (14 CFR Parts 21, 25, and 36) are amended, effective May 6, 1988.

The authority citation for Part 21 continues to read as follows:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C. 1857f-10, 4321 et seq.; E.O. 11514; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

Amendment 21-63

Noise Certification Standards for Propeller-Driven Small Airplanes

Adopted: September 23, 1988 **Effective: December 22, 1988**

(Published in 53 FR 47394, November 22, 1988)

SUMMARY: This final rule, which is based on Notice 86-10 (51 FR 25500), revises noise certification standards for propeller-driven small airplanes and propeller-driven, commuter category airplanes by substituting the use of actual takeoff tests for the level flyover tests currently specified. Subsequent to the publication of Notice 86-10, Parts 21, 23, 36, 91, and 135 of the Federal Aviation Regulations (FAR) were amended to adopt certification procedures, airworthiness and noise standards, and operating rules for an additional category of propeller-driven, multiengine airplane, designated as the Commuter Category. As a result of these amendments, propeller-driven, commuter category airplanes have been included in this final rule. This rule revises noise certification test procedures as of December 22, 1988, and revises the noise level limit numbers to approximate the sound levels measured and corrected in accordance with Appendix F of Part 36. This rule resulted from industry requests that noise certification be more directly based upon typical in-service noise measurements and from studies conducted over a three year period under the auspices of the International Civil Aviation Organization. The rule exempts both antique airplanes and airplanes modified by the addition of floats or skis from the acoustical change measurement and documentation requirements of Part 21.

DATE: Effective date of this amendment is December 22, 1988. The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of December 22, 1988.

FOR FURTHER INFORMATION CONTACT: Mr. Steven Albersheim, Noise Policy and Regulatory Branch (AEE-110), Noise Abatement Division, Office of Environment and Energy, Federal Aviation Administration, 800 Independence Ave., SW, Washington, DC 20591; telephone (202) 267-3560.

SUPPLEMENTARY INFORMATION:

Synopsis of the Final Rule

Part 36 of the Federal Aviation Regulations (14 CFR Part 36) contains noise standards for aircraft type and airworthiness certification. Appendix F of Part 36 contains the provisions currently applicable to propeller-driven small airplanes and propeller-driven, commuter category airplanes. Compliance with Appendix F is now determined by a level flyover test for which the measured noise is subjected to a calculated "correction" to account for differences in aircraft performance between level flight and takeoff. This rule amends Part 36 by adding an Appendix G to include actual takeoff noise tests, instead of the present level flyover test, eliminating the need for the performance correction. The amendment provides the test conditions, procedures, and noise levels necessary to demonstrate compliance with certification requirements. The new noise standard affects the following items:

A. *Certification Procedure Provisions.*

The new rule amends FAR Part 36 by adding an Appendix G which contains the specifications for conducting takeoff noise certification tests. This appendix also contains procedures for adjusting measured noise data for the differences in aircraft performance and acoustic propagation between the test day and the reference standard day. The effective date for Appendix G is December 22, 1988.

B. *Noise Level Standard.*

Appendix G provides for the continued use of the A-weighted sound level (L_A) as the noise measure for propeller-driven small airplanes and propeller-driven, commuter category airplanes.

The Appendix G noise level limit is simply a translation of the current Appendix F noise limit which accounts for the difference in noise level resulting from the change in test airspeed and distance that the airplane is from the microphone. Even though the Appendix G noise level limit is now 5 decibels higher than the Appendix F limit, no change in absolute noise level requirements is expected to occur from this amendment.

C. *Acoustical Change.*

FAR Part 21 has been amended to remove the present limitations on acoustical changes. These limitations were based on the use of the level flyover test and had no provision for increased airplane weight or decreased performance. With this revision, FAR Part 21 now uses one acoustical change provision for all airplanes that are noise certificated using a takeoff test.

The revision to FAR Part 21 also exempts from the acoustical change requirements antique airplanes, i.e., those that had flight time before January 1, 1955, and airplanes modified by the addition of floats or skis. The owners of antique aircraft often experience difficulty in finding airworthy parts, e.g., engines, needed to keep aircraft in safe operable condition. They, therefore, often opt to make changes based on current parts availability and safety. The typical operator of an antique aircraft owns only one airplane and the acoustical change situations arise infrequently; thus, the FAA does not believe that adding noise requirements is justified either economically or environmentally.

REGULATORY HISTORY

On December 31, 1974, the FAA adopted noise standards (40 FR 1029) for propeller-driven small airplanes, which prescribed noise standards for the issue of normal, utility, acrobatic, transport, and restricted type certificates. The rule also prescribed noise standards for airworthiness certificates and restricted category airworthiness certificates for newly produced propeller-driven small airplanes of older type designs. Finally, the rule prohibited acoustical changes in the type design of those airplanes where those changes increased noise levels beyond specified limits. Section 611 of the Federal Aviation Act of 1958 (49 U.S.C. 1431), as amended by the Noise Control Act of 1972 (P.L. 92-574) provided the statutory authority for the provisions published in Notice 73-26 in the Federal Register on October 10, 1973 (38 FR 28016). A corrective amendment was published in the Federal Register on February 11, 1975 (40 FR 6346). The adopted standards were again amended (41 FR 56506; December 23, 1976) as a result of two proposals submitted to the FAA by the Environmental Protection Agency (40 FR 820, January 3, 1975, and 40 FR 1061; January 6, 1975).

A further amendment (45 FR 67064, October 9, 1980) applied to new production of previously exempt agricultural and fire-fighting airplanes (without flight time before January 1, 1980), and to acoustically changed airplanes (without flight time in the changed configuration before January 1, 1980) that had not been shown to comply with Part 36 noise levels.

In May 1983, the International Civil Aviation Organization (ICAO) Committee on Aircraft Noise recommended replacing the ICAO flyover noise standard with a takeoff noise standard. In July 1986, a Notice of Proposed Rulemaking (NPRM) was published in the Federal Register (Notice 86-10, 51 FR 25500; July 14, 1986) to solicit comments on the proposal to revise noise certification for propeller-driven small airplanes by substituting the use of actual takeoff tests for the level flyover tests specified in Appendix F of Part 36. This final rule is substantially the same as the ICAO recommendation, except for microphone placement and associated noise limits.

NEED FOR REGULATION

The noise certification method for propeller-driven small airplanes contained in Appendix F approximated the takeoff noise by requiring level flyovers and making "corrections" calculated from measured or assumed aircraft performance. However, ground measurements recorded during actual takeoffs seldom agreed with the Appendix F certification levels. As a result, the General Aviation Manufacturers Association suggested that the noise certification rules should be changed to employ actual takeoff noise measurements. Thus, the purpose of this amendment is only to change the noise testing procedure and not to lower the absolute noise limitations.

Additionally, under § 611 of the Federal Aviation Act of 1958, as amended (the Act), the FAA Administrator, in prescribing or amending aircraft noise regulations, is required to consider, among other things, whether the action is consistent with the highest degree of safety in air commerce and whether it is economically reasonable, technologically practicable, and appropriate for the particular type of aircraft to which it would apply. The FAA believes that this final rule meets the requirements of § 611 of the Act.

RULE STRUCTURE AND TIMING

As a part of this rule, an Appendix G has been added to Part 36. This appendix is structured along the general lines of Appendix F which contains the requirements for noise certification of propeller-driven small airplanes and propeller-driven, commuter category airplanes using the level flyover test. While both procedures share some common elements e.g., the use of the A-weighted decibel as the unit of noise measure), their differences are so pervasive that concern for the clarity of the resulting regulation requires the use of a separate appendix.

Similarly, to preclude questions of the applicability of each procedure, the FAA will require the use of Appendix G for all tests conducted on or after December 22, 1988, regardless of the date of application for type certification. This will eliminate the regulatory burden that would be imposed on applicants if different standards and tests were required for different airplanes, or models thereof, in the same product line. On or after December 22, 1988, all noise certification tests will be conducted pursuant to Appendix G.

ANALYSIS OF THE AMENDMENTS

The amendment to establish a takeoff test procedure for the noise certification of propeller-driven small airplanes and propeller-driven, commuter category airplanes revises existing Parts 21 and 36 to the Federal Aviation Regulations (14 CFR Parts 21 and 36) as follows:

1. Section 21.93 defines changes to an aircraft type design which require recertification for noise, i.e., acoustical changes. Recertification for those "acoustical changes" for propeller-driven small airplanes and propeller-driven, commuter category airplanes was limited to (a) changes to or removal of mufflers or similar noise-control components or (b) increases in installed power or propeller tip speed. This amendment expands the definition of acoustic change. As amended, § 21.93 states that any voluntary change in the type design of an airplane which may increase the noise levels of that airplane is an "acoustical change". This change allows one "acoustic change" definition to be used by all airplanes.

Section 21.93 has also been amended to eliminate recertification for acoustic change for antique airplanes and land-based airplanes which only add (or substitute) floats or skis to already certificated wheeled aircraft. Recertification for acoustic change is required for acoustic changes made after a wheeled aircraft has been reconfigured with floats or skis. The new definition of "antique" airplane is limited to U.S. registered airplanes with flight time prior to January 1, 1955. As amended in this respect, § 21.93 is now consistent with § 45.22(b) which grants an exemption to antique aircraft from nationality and registration marking. There is no change in airworthiness certification requirements as a result of this rule.

2. Two additional technical publications have been incorporated by reference in § 36.6. The publications contain technical specifications for noise measurement and analysis equipment and are available from the International Electrotechnical Commission. Section 36.6 provides information concerning the purchase of these additional publications and a listing of the U.S. Government offices where the publications are available for inspection. The listing of these offices has been updated to account for changes which occurred subsequent to publication of Notice 86-10. However, this change does not effect the scope of this final rule.

3. Section 36.9 has been amended to require that noise tests conducted for acoustical changes be performed in accordance with § 36.501. At present § 36.9 requires compliance with Appendix F. However, § 36.501 directs applicants to the appropriate appendix.

4. Section 36.501 has been expanded to direct applicants for new, amended, and supplemental type certificates to the appropriate noise limit in Appendix F for certification tests completed before December 22, 1988, or Appendix G for certification tests completed on or after December 22, 1988.

5. Paragraphs (b) and (c) of § 36.501 have been amended to direct applicants for new, amended, and supplemental type certificates to the appropriate noise certification regulation. The amendment establishes December 22, 1988, as the date on or after which all noise certification tests for propeller-driven small airplanes and propeller-driven, commuter category airplanes will be conducted using the methods and procedures of Appendix G. All tests completed before this date will use Appendix F. The noise levels appropriate to each procedure are contained in the applicable appendix.

6. The title of Appendix F has been changed to clearly indicate that it only pertains to the flyover test requirements for propeller-driven small airplanes and propeller-driven, commuter category airplanes.

7. Similarly, the description of the scope of Appendix F, contained in section F36.1, has been amended to reflect its new status.

8. An Appendix G has been added to FAR Part 36 and its contents are summarized as follows:

Part A—General

The scope of Appendix G is specified in section G36.1. The appendix prescribes procedures and certification noise levels applicable to tests of propeller-driven small airplanes and propeller-driven, commuter category airplanes which are conducted on or after December 22, 1988. Tests for propeller-driven small airplanes and propeller-driven, commuter category airplanes which are conducted prior to December 22, 1988, will be performed under Appendix F.

Part B—Noise Measurement

Section G36.101 specifies takeoff test conditions including both the physical conditions for the noise measurement site and the meteorological "test window". The meteorological window in which testing is allowable is larger for Appendix G than for Appendix F. Specifically, temperature and relative humidity limits for Appendix G have been increased to match those currently used for testing of large propeller-driven and turbojet powered aircraft. These new limits should decrease the need and costs of waiting for acceptable weather conditions before starting tests. The wind limits have been changed to include limits on both total wind and cross-wind velocity. Appendix F only has a total wind limit coupled with a requirement to align the airplane flight direction within ± 15 degrees of the wind under certain circumstances.

Section G36.103 describes the acoustical measurement system. Since the noise unit chosen for Appendix G is the same as that for Appendix F, no changes in this section have been made.

Section G36.105 is similar to the corresponding section of Appendix F, with some additional technical guidance provided. Specifically, two additional documents from the International Electrotechnical Commission (Publication No. 651, entitled "Sound Level Meters" and No. 561, entitled "Electro-acoustical Measuring Equipment for Aircraft Noise Certification") are incorporated by reference. A reference to the calibration procedures contained in Appendix A is also added to clarify the requirements in this area. The section adds two more categories of acceptable sound level recording instrumentation, graphic level recorders and sound level meters. These additions increase the flexibility of the rule and lower the costs to the applicant. Additionally, use of an inexpensive windscreen is required when the wind speed exceeds 5 knots. This requirement will improve the signal-to-noise ratio on windy days, improve the data, and increase the number of test days available to applicants.

Section G36.107 specifies the requirements for noise measurement procedures, including the orientation of the microphone during takeoff. The orientation of the microphone sensing elements during the test must be related to the direction from which the sound was coming during calibration. Similarly, the recorder must be calibrated within 10 decibels of the full-scale value. Both of these requirements are intended to ensure that differences between measurement systems will not affect measured sound levels.

Section G36.109 provides guidance on the types and extent of data necessary for noise certification including information on the equipment and its response, and meteorological and topography features that might affect noise measurements, aircraft performance, and noise levels. For takeoff noise tests, information must be gathered on aircraft performance and position when the airplane is directly over the microphone to make the corrections required in section G36.201.

Section G36.111 specifies airplane flight procedures with measurement distances taken from the microphone location at the noise measuring site. Specifically, the start of takeoff roll must be 8200 feet from the noise measuring site and the aircraft must pass over it within ten degrees from the vertical and within twenty percent of the reference (standard day) altitude. The reference day is a no-wind, sea level day at 59°F and 70 percent relative humidity. The 59°F standard is that used for calculating aircraft performance for airworthiness certification and by using this value, rather than the 77°F used in Appendix F, applicants need not re-compute aircraft performance solely for noise certification purposes. Such calculations are not currently necessary under Appendix F since aircraft noise during level flyover can generally be assumed to be independent of temperature.

Part C—Data Corrections

Section G36.201 contains the technical specifications for the corrections to measured data necessary under Appendix G. Corrections are required to convert the data to standard reference conditions for (1) atmospheric absorption, (2) noise path length differences caused by conditions such as changes in altitude, (3) propeller tip speed, and (4) engine power. This section does not require correction for atmospheric absorption if the test is conducted within a "no-correction" window, shown in figure G1. A similar "no-correction" window is provided for certain tests conducted within five percent of the reference power.

Section G36.203 requires that the measurement point be overflown at least six times to get enough measurements for a statistically valid average sound level. Further, tha variation of these flights must be such that the confidence limit does not exceed 1.5 dB(A).

Part D—Noise Limits

The noise level limits for the takeoff tests of propeller-driven small airplanes and propeller-driven, commuter category airplanes are contained in section G36.301. The noise level must not exceed 73 dB(A) up to and including aircraft weights of 1,320 pounds. Between 1,320 pounds and 3,300 pounds, the noise limit increases linearly at a rate of 1 dB(A) for each 165 pounds from 73 dB(A) to 85 dB(A). Between 3,300 pounds and 19,000 pounds, noise cannot exceed 85 dB(A). The maximum weight of the airplane at brake-release must be the maximum weight for which noise certification is requested.

These limits (and all of Appendix G) apply to tests conducted on or after December 22, 1988, for noise certification for a new, amended, or supplemental type certificate. The choice of a single date on which to apply Appendix G, is intended to provide for the smooth transition to the new test procedures and to ensure equitable treatment for all applicants.

REGULATORY IMPACT EVALUATION

The FAA conducted a detailed regulatory evaluation which is included in the regulatory docket. This evaluation reviews all changes to Parts 21 and 36. The FAA determined that the final rule is considered to be significant as defined in Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979) and is not major as defined in Executive Order 12291.

Little or no increase in costs will result from the proposed changes in certification procedures. Such costs, when they occur, could result from limits on future versions of existing aircraft types where those affected aircraft types demonstrate poorer-than-average climb capabilities during takeoff.

REGULATORY FLEXIBILITY DETERMINATION

As detailed in the evaluation, the amendments adopted to Part 36 will not impose any new requirements on small or large entities. In fact, several amendments will reduce regulatory burdens to owners of certain airplanes (e.g., antique airplanes). The majority of changes to Part 36 are either editorial or clarifying in nature. Stringency is neither increased nor decreased. Since no substantial costs are incurred with adoption of the new amendments, it is certified under the criteria of the Regulatory Flexibility Act, the final rule will not have a significant economic impact on a substantial number of small entities.

ENVIRONMENTAL ANALYSIS

Pursuant to Department of Transportation "Policies and Procedures for Considering Environmental Impacts" (FAA Order 1050.1D), the FAA has determined that this rule will not constitute a major Federal action significantly affecting the quality of the human environment. The amendment will have no net effect on noise levels around airports, including those used exclusively for general aviation. Therefore, no environmental assessment or environmental impact statement is necessary.

TRADE IMPACT ANALYSIS

Little or no impact on U.S. or foreign trade will occur as a result of this amendment. The majority of changes to Part 36 are either editorial or clarifying in nature, and stringency is neither increased nor decreased. Absent the rule, U.S. propeller-driven small aircraft and propeller-driven, commuter category aircraft exports may be placed at a competitive cost disadvantage since each model would be required to be certificated to both the current Appendix F flyover test and the ICAO takeoff test. The cost of multiple certifications would result in either higher selling prices or lower profits to U.S. manufacturers.

FEDERALISM IMPLICATIONS

The regulations adopted in this final rule will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. Thus, in accordance with Executive Order 12612, it is determined that this final rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

DISCUSSION OF COMMENTS

Interested persons were afforded the opportunity to participate in development of this rulemaking by submitting written comments to the public regulatory docket on or before October 9, 1986. All comments received have been reviewed and duly considered in promulgating this amendment.

Nineteen public comments were received in response to the notice (Docket No. 25034). All of the comments supported the revision of noise standards for propeller-driven small airplanes by substituting the use of actual takeoff tests for the level flyover tests specified in Appendix F; however, each commenter also had specific suggestions about one or more of the FAA's proposed amendments.

The comments received in public Docket No. 25034 were grouped by broad categories of issues and are discussed below.

1. Microphone Placement

A number of commenters recommended that a ground plane microphone be used for the measurement program instead of a microphone situated four feet above ground level. The ground plane microphone was recommended for greater accuracy of measurements and for standardization with ICAO measurement procedures. One commenter suggested that some recognition, in this rule, of measurements taken concurrently with both the ground plane microphone and the four foot high microphone is necessary in order to ensure that the FAA's verification of ground plane microphone measurements will be accepted by foreign certification authorities.

After consideration of the ground plane microphone, the FAA has chosen to continue using the four foot high microphone location for several reasons. First, the four foot microphone height measures noise where people receive it. Second, since noise measurements to date have been taken using a four foot microphone height, establishing a noise limit based on ground plane microphone measurements would require the FAA to first obtain additional data using the ground plane microphone in order to establish a reference database. Third, the class of airplanes to which this rule applies often use airports where jets and other large aircraft also fly. The noise from those other aircraft is measured at four feet above ground level. Thus, there would be no way to compare the certificated noise levels of different aircraft using the same airport.

To lessen the burden on U.S. manufacturers which export aircraft, the FAA will approve, upon request, supplemental measurements obtained using the ground plane microphone. Although approved by the FAA, this supplemental information will not be considered a certification unless it is approved by the civil aviation authority of the country of import.

2. Aircraft Weight

Several commenters recommended that the upper weight limit of aircraft tested under this rule be increased to comply with the ICAO standard and to be consistent with NPRM, Notice 83-17 (48 FR 52010; November 15, 1983) which contained requirements for an additional category of propeller-driven, multiengine airplane, designated as the Commuter Category. The Commuter Category applies to airplanes with a maximum seating capacity, excluding pilot seats, of 19 or less, and a maximum certificated weight of 19,000 pounds or less. The final rule for the Commuter Category airplane was adopted on January 15, 1987 (52 FR 1806). NPRM, Notice 86-10 (51 FR 25500; July 14, 1986) was published for comment before the Commuter Category final rule was adopted and only covered certification of propeller-driven small airplanes of weights up to and including 12,500 pounds. To include Commuter Category airplane noise certification in Appendix G of Part 36, the upper weight limit for testing under Appendix G has been increased to 19,000 pounds.

3. Meteorological Conditions

Several commenters were concerned with the meteorological conditions and measurement procedures necessary for compliance with Appendix G. One commenter questioned the need to apply a restriction on tests where the atmospheric absorption at 8 KHz is greater than 12 dB/100 meters since the propeller blade passing or engine firing frequencies and their harmonics rarely produce energy above 1 KHz. Another commenter recommended locating the thermometer to measure ambient temperature and the hygrometer to measure relative humidity at 4 feet above the ground to avoid the need for remote monitoring. The NPRM proposed that meteorological measurements be made between 10 feet and 33 feet of the surface. Several commenters recommended that the no-correction window for atmospheric absorption be changed to comply with the ICAO standard. The NPRM proposed a requirement for atmospheric absorption correction for noise data obtained when the temperature is outside the range of 50 to 95 degrees F (10 to 35 degrees C) and/or when the relative humidity is outside the range of 45 to 95 percent. One commenter suggested that testing with a temperature inversion should be permitted if a layered atmosphere with appropriate temperature and relative humidity measurements is used.

After consideration of the technical issues involved, the FAA has determined that the rule should not include a restriction on test conditions based on the atmospheric absorption at 8 KHz. By eliminating this restriction, the temperature/relative humidity window required for testing is now the same as the ICAO window, i.e., the ambient air temperature must be between 36 and 95 degrees F (2.2 and 35 degrees C) and relative humidity must be between 20 percent and 95 percent.

Further, for test simplification, the rule allows temperature and relative humidity measurements to be made with the thermometer and hygrometer situated between 4 feet and 33 feet of the surface instead of the NPRM measurement height of between 10 feet and 33 feet.

The no-correction window for atmospheric absorption has been modified to comply with the ICAO standard. Figure Gl contains the no-correction window for atmospheric absorption.

The correction to account for differences between the test and reference height of the airplane over the noise measuring point has been changed to that used by ICAO. The NPRM specified the correction Delta (1) = 22 log (H_T/H_R), where H_T is the height of the test aircraft when directly over the noise measurement point and H_R is the reference height. The final rule requires the correction Delta (1) = 20 log (H_T/H_R) be used when test day conditions are outside of those specified in the atmospheric absorption no correction window (Figure G1). Delta (1) = 22 log (H_T/H_R) will only be used when test day conditions are within those specified in figure G1.

Finally, it should be noted that section G36.101 is not intended to preclude using a layered atmosphere to correct for a temperature inversion, provided the correction procedure is approved by the FAA. The rule allows as much flexibility as possible with regard to meteorological conditions. Thus, no provision was made to require that a layered atmosphere be used when testing with a temperature inversion if the inversion would not significantly alter the measured noise level of the airplane.

4. Rule Effective Date

Several comments were received regarding the effective date of the rule. Appendix G prescribes procedures and noise levels applicable to noise certification of propeller-driven small airplanes and propeller-driven, commuter category airplanes conducted on after December 22, 1988. The comments recommended that the date of applicability for the rule be based upon the date of application for the type certificate rather than on when the airplane is tested. In addition, two comments recommended that a time period be established during which a manufacturer who fails to meet the new standard may revert to the existing standard to protect his investment. One comment stated that it was possible for an airplane to satisfy Appendix F, the existing noise certification standard, but be rendered non-compliant under Appendix G.

While recognizing the commenters' concerns about meeting Appendix G certification requirements, the intent of the FAA is to standardize the takeoff noise tests for all propeller-driven small airplanes and propeller-driven, commuter category airplanes. The criteria of Appendix G are designed so that airplanes which meet Appendix F certification requirements should also meet Appendix G requirements. Thus, the final rule requires certification to Appendix G for airplanes tested on or after December 22, 1988.

5. Acoustical Change

One comment stated that the FAA proposal to remove limitations on the definition of acoustical change for propeller-driven small airplanes and align this definition with that used by all other airplanes may impose an unnecessary burden on the manufacturers of this class of airplane. The comment went on to say that the definition of acoustical change currently in § 21.93 has considerable utility because it effectively excludes the need to retest airplanes for minor configuration changes that experience has shown do not increase (or decrease) the measured noise levels.

Section 21.93 of the FAR currently limits the definition of acoustical change for propeller-driven, commuter category airplanes and propeller-driven small airplanes in the normal, utility, acrobatic, transport, and restricted categories to the following type design changes:

(i) Any change to or removal of a muffler or other component designed for noise control.

(ii) Any change to, or installation of, a powerplant or propeller that increases maximum continuous power or thrust at sea level, or increases the propeller tip speed at that power or thrust, over that previously approved for the airplane.

The new rule defines an acoustical change as any voluntary change in the type design of an airplane that may increase the noise levels of that airplane. The FAA agrees with the intent of the comment to avoid retesting for minor configuration changes which are known not to increase the noise level and believes that the new wording more clearly meets that intent. This rule will not require testing for changes which, by past experience, have been shown not to increase noise.

6. Sound Recording

Two comments were received concerning the use of a sound level meter to record test data. Section G36.105 allows airplane noise to be recorded using a magnetic tape recorder, graphic level recorder, or sound level meter when approved by the regional certification authority. One commenter stated that the requirement in section G36.105(a) that the test data should be recorded allowing a graphic level recorder or sound level meter to be used instead of a magnetic tape recorder is inconsistent with the rest of the section. Another comment, addressing the same section, questioned why a sound level meter is acceptable if the sound must be recorded. The comment went on to say that the reading of a sound level meter may be recorded, but this does not constitute recording the noise.

Appendix G is written with the intent of allowing the greatest amount of flexibility possible in order to avoid imposing undue economic burden on any applicant. Allowing the option to use a graphic level recorder or sound level meter is done to permit certification to be accomplished as inexpensively as possible. Thus, when approved by the regional certification authority, a sound level meter, graphic level recorder, or magnetic tape recorder is acceptable for recording airplane noise.

A further clarification has been added to section G36.105 concerning the type of sound level meter to be used. The intent of the rule is to use Type 1 sound level meters, as specified in Appendix F (IEC publication 179). The NPRM specified that sound level meters must comply with International Electrotechnical Commission (IEC) Publication No. 651, entitled "Sound Level Meters." Publication No. 651 supersedes Publications 123 (1961), 179 (1965 and 1973), and 179A (1973). Although Publication 651 contains standards for Type 0,1,2, and 3 sound level meters, it does not specify the type of sound level meter to be used for noise measurement. To correct this ambiguity, section G36.105 has been revised to specify the use of Type 1 sound level meters for Appendix G noise certification.

7. Limiting Noise Value

One commenter recommended that the FAA adopt the aircraft noise limits established by ICAO for noise certification of propeller driven small airplanes.

The aircraft noise limits specified in the FAA rule are as follows. The noise level must not exceed 73 dB(A) up to and including aircraft weights of 1,320 pounds (600 kg). For weights greater than 1,320 pounds, the limit increases at the rate of 1 dB/165 pounds (1 dB/75 kg) up to 85 dB(A) at 3,300 pounds (1,500 kg), after which it remains at 85 dB(A) up to and including 19,000 pounds (8,640 kg).

ICAO specifies a 76 dB(A) limit up to an airplane mass of 600 kg, then increasing with the logarithm of airplane mass at the rate of 9.83 dB(A) per doubling of mass until 88 dB(A) is reached, after which the limit is constant up to 9000 kg. Thus, the difference in noise limits between the FAA rule and ICAO rule is approximately 3 dB(A) throughout the range of weight values for which the rule applies.

The higher ICAO noise limits can be attributed to their use of a ground plane microphone instead of the four foot height installation. Generally, a ground plane microphone will provide a noise level several dB(A) greater than a microphone situated four feet above ground level for the same airplane. Thus, the difference in limiting noise values between the FAA rule and the ICAO rule is due to a difference in measurement technique rather than a difference in noise standards.

8. Helical Tip Mach Number Correction

One commenter recommended that, in section G36.201(d)(3), the phrase "no correction is to be made when M_t is larger than M_r" should be deleted since it might be interpreted to apply to all cases, even those for which a specific value of the constant "k" has been determined. The constant "k" is equal to the slope of the line obtained for measured values of noise level in dB(A) versus helical tip Mach number.

The FAA agrees that if a specific value of k has been determined, a correction should be allowed when the test helical tip Mach number, M_t, is larger than the reference helical tip Mach number, M_r. The NPRM phrase "no correction is to be made when M_t is larger than M_r" was meant to apply only to cases where the nominal value of k is to be used for the correction. To avoid confusion over this point, section G36.201(d)(3) has been revised as follows. The phrase "no correction is to be made when M_t is larger than M_r" has been deleted. The sentence "No correction may be made using the nominal value of k when M_t is larger than M_r." has been added.

9. Noise Level vs Airplane Weight Graph

One commenter suggested including a figure showing graphically the noise level limits as a function of airplane weight. The FAA agrees that the addition of a figure showing noise limits as a function of airplane weight would simplify interpretation of the rule. Thus, figure G2 has been added to section G36.301.

10. Microphone Diameter

One commenter recommended that since the ICAO test procedure specifies that a one half inch diameter microphone be used for data measurement, a one half inch microphone diameter should be specified for the FAA rule in order to achieve better international acceptance of data measured in accordance with the FAA procedure (and of data measured using the ground plane microphone). The NPRM did not specify a microphone size required for data measurement.

The FAA does not find it necessary to specify microphone diameter for noise certification testing in accordance with Appendix G. Both ICAO and the FAA require the same microphone frequency response tolerance. Therefore, the data should be accepted internationally. The one half inch diameter microphone is required for the ground plane microphone installation and thus is only an issue when the ground plane microphone is used.

11. Altitude Tolerance

One commenter recommended that the FAA consider eliminating the requirement that the aircraft pass over the measurement point within 20 percent of the reference altitude. The commenter stated that this requirement is unnecessary since section G36.201 requires a correction to the noise level if the test altitude differs from the reference altitude.

After consideration of this comment, the FAA chose to retain the requirement that the aircraft pass over the measurement point within 20 percent of the reference altitude. This requirement is necessary due to the inaccuracy of the correction for deviations from the reference altitude and for consistency with the ICAO standard.

12. Test Flight Tolerances

In keeping with the general recommendation of most of the commenters that the FAA maintain standardization with the ICAO noise certification rule and to simplify the certification test flight procedure, the FAA has included a tolerance on the flight test speed and weight. As written, the language in the NPRM would have required each test flight to be conducted at a single precise airspeed and weight. The FAA notes that all other Part 36 flight test procedures include reasonable tolerances for the specified reference test conditions. Further, the FAA believes that such tolerances are necessary to account for pilot and meteorological variability from test to test, and for the weight of fuel burned during testing. Accordingly, the ICAO Annex 16 test tolerances have been added to section G36.111(a).

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ADOPTION OF THE AMENDMENTS

Accordingly, Parts 21 and 36 of the Federal Aviation Regulations (14 CFR Parts 21 and 36) are amended effective December 22, 1988.

The authority citation for Part 21 continues to read as follows:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C. 1857F-10, 4321 et seq.; E.0 11514; 49 U.S.C. 106(g)(Revised Pub. L. 97-449, January 12, 1983).

Amendment 21-64

Responsibilities of Manufacturers of Parts and Products Produced Under a Production Certificate

Adopted: November 28, 1988 **Effective: January 3, 1989**

(Published in 53 FR 48520, December 1, 1988)

SUMMARY: This amendment clarifies the responsibility of a production certificate holder with respect to the manufacture of a replacement or modification part for installation on a type certificated product. The amendment is intended to ensure that such manufacturers are aware of their responsibility to determine that each part produced conforms to its approved design and is in a condition for safe operation.

FOR FURTHER INFORMATION CONTACT: Melanie R. Miller, Aircraft Manufacturing Division, (AIR-200), Aircraft Certification Service, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, D.C. 20591, telephone (202) 267-8361.

ADDRESSES: Comments may be mailed or delivered in duplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket (AGC-10), Docket No.25745, 800 Independence Avenue, SW., Washington, D.C. 20591. Comments may be examined in the Rules Docket weekdays, except Federal holidays, between 8:30 a.m. and 5 p.m.

SUPPLEMENTARY INFORMATION

Comments Invited

Even though this action is in the form of a final rule which involves clarification of an existing rule and was not preceded by notice and public comment procedure, comments are invited on the rule change. Interested persons are invited to comment on any portion of this rule by submitting written data, views, or arguments as they may desire. When the comment period ends, the FAA will use the comments submitted, together with other available information, to review the regulations. After the review, if the FAA finds that changes are appropriate, it will initiate rulemaking proceedings to amend the regulations. Comments that provide the factual basis supporting the views and suggestions presented are particularly helpful in evaluating the effects of the rule. Anyone wishing the FAA to acknowledge receipt of their comments submitted in response to this final rule must submit with those comments a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. 25745." The postcard will be date/time stamped and returned to the commenter. All comments submitted will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report summarizing each substantive public contact with FAA personnel concerned with this rulemaking will be filed in the docket.

Background

Section 21.303 of the Federal Aviation Regulations (FAR) specifies that no person may manufacture a replacement or modification part for sale for installation on a type certificated product unless it was produced by an owner or operator for use on his own product, or was produced under a Parts Manufacturer Approval (PMA), a type certificate or production certificate, or a Technical Standard Order (TSO). The requirement that these parts be produced under an FAA-approved quality control system helps ensure that installation of replacement or modification parts on type certificated products does not adversely affect the airworthiness of the product. In addition, with respect to parts produced under a PMA, § 21.303(k) specifically requires that the manufacturer determine that each completed part conforms to the design data and is in a condition for safe operation. With respect to parts produced under a production certificate, however, § 21.165(b) provides that the manufacturer must determine that each completed product conforms to the type design and is in a condition for safe operation.

Discussion

The FAA has historically regarded the requirement of a determination of conformity and condition for safe operation as applicable to all parts produced for installation on a type certificated product, including those manufactured under a production certificate, even though the word "parts" does not appear in § 21.165(b). However, it has come to the attention of the FAA that recently there has been some confusion as to the applicability of the requirement to parts produced under a production certificate. Compliance with this requirement by all parts manufacturers is essential to aviation safety and, therefore, the FAA is amending the rule to clearly establish that a manufacturer under a production certificate is also required to ensure conformity and condition for safe operation of each part.

Good Cause Justification for Making This Amendment Effective Without Prior Public Comment

Since this amendment merely clarifies an existing standard and imposes no additional burden on any person, I find that notice and public procedures are unnecessary and would not reasonably be expected to result in the receipt of beneficial information. However, interested persons are invited to submit such comments as they may desire regarding this amendment.

Conclusion

The adoption of this amendment serves to clarify currently existing responsibilities of manufacturers of parts and products under production certificates. The amendment imposes no additional burden on any party. Therefore, the FAA has determined that this amendment is not a major rule under Executive Order 12291 or a significant rule under the Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). In addition, it is certified that under the criteria of the Regulatory Flexibility Act, this rule will not have a significant impact, positive or negative, on a substantial number of small entities, and the rule does not warrant preparation of a regulatory evaluation as the overall impact on manufacturers will be minimal.

Federalism Determination

The amendment set forth herein would not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. The amendment set forth would be promulgated pursuant to the authority in the Federal Aviation Act of 1958, as amended (49 U.S.C. 1301, et seq.), which has been construed to preempt state law regulating the same subject. Therefore, in accordance with Executive Order 12612, it is determined that such a regulation does not have federalism implications warranting the preparation of a Federalism Assessment.

THE AMENDMENT

In consideration of the foregoing, the Federal Aviation Administration amends Part 21 of the Federal Aviation Regulations (14 CFR Part 21) effective January 3, 1989.

The authority citation for Part 21 continues to read as follows:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2): 42 U.S.C. 1857f-10, 4321 et seq., E.O. 11514; 49 U.S.C. 106(g) (Revised, Pub. L. 97-449, January 12, 1983).

Part 21—Certification Procedures for Products and Parts

Subpart A—General

§ 21.1 Applicability.

(a) This Part prescribes—

(1) Procedural requirements for the issue of type certificates and changes to those certificates; the issue of production certificates; the issue of airworthiness certificates; and the issue of export airworthiness approvals;

(2) Rules governing the holders of any certificate specified in subparagraph (1); and

(3) Procedural requirements for the approval of certain materials, parts, processes, and appliances.

(b) For the purposes of this Part, the word "product" means an aircraft, aircraft engine, or propeller. In addition, for the purposes of Subpart L only, it includes components and parts of aircraft, of aircraft engines, and of propellers; also parts, materials, and appliances, approved under the Technical Standard Order system.

[§ 21.3 Reporting of failures, malfunctions, and defects.

[(a) Except as provided in paragraph (d) of this section, the holder of a Type Certificate (including a Supplemental Type Certificate), a Parts Manufacturer Approval (PMA), or a TSO authorization, or the licensee of a Type Certificate shall report any failure, malfunction, or defect in any product, part, process, or article manufactured by it that it determines has resulted in any of the occurrences listed in paragraph (c) of this section.

[(b) The holder of a Type Certificate (including a Supplemental Type Certificate), a Parts Manufacturer Approval (PMA), or a TSO authorization, or the licensee of a Type Certificate shall report any defect in any product, part, or article manufactured by it that has left its quality control system and that it determines could result in any of the occurrences listed in paragraph (c) of this section.].

(c) The following occurrences must be reported as provided in paragraphs (a) and (b) of this section:

(1) Fires caused by a system or equipment failure, malfunction, or defect.

(2) An engine exhaust system failure, malfunction, or defect which causes damage to the engine, adjacent aircraft structure, equipment, or components.

(3) The accumulation or circulation of toxic or noxious gases in the crew compartment or passenger cabin.

(4) A malfunction, failure, or defect of a propeller control system.

(5) A propeller or rotorcraft hub or blade structural failure.

(6) Flammable fluid leakage in areas where an ignition source normally exists.

(7) A brake system failure caused by structural or material failure during operation.

(8) A significant aircraft primary structural defect or failure caused by any autogenous condition (fatigue, understrength, corrosion, etc.).

(9) Any abnormal vibration or buffeting caused by a structural or system malfunction, defect, or failure.

(10) An engine failure.

(11) Any structural or flight control system malfunction, defect, or failure which causes an interference with normal control of the aircraft or which derogates the flying qualities.

(12) A complete loss of more than one electrical power generating system or hy-

draulic power system during a given operation of the aircraft.

(13) A failure or malfunction of more than one attitude, airspeed, or altitude instrument during a given operation of the aircraft.

(d) The requirements of paragraph (a) of this section do not apply to—

[(1) Failures, malfunctions or defects that the holder of a Type Certificate (including a Supplemental Type Certificate), Parts Manufacturer Approval (PMA), or TSO authorization, or the licensee of a Type Certificate—]

(i) Determines were caused by improper maintenance, or improper usage;

(ii) Knows were reported to the FAA by another person under the Federal Aviation Regulations; or

(iii) Has already reported under the accident reporting provisions of Part 430 of the regulations of the National Transportation Safety Board.

[(2) Failures, malfunctions or defects in products, parts, or articles manufactured by a foreign manufacturer under a U.S. Type Certificate issued under § 21.29 or § 21.617, or exported to the United States under § 21.502.]

(e) Each report required by this section—

(1) Shall be made to the FAA Regional Office in the region in which the person required to make the report is located within 24 hours after it has determined that the failure, malfunction, or defect required to be reported has occurred. However, a report that is due on a Saturday or a Sunday may be delivered on the following Monday and one that is due on a holiday may be delivered on the next workday;

(2) Shall be transmitted in a manner and form acceptable to the Administrator and by the most expeditious method available; and

(3) Shall include as much of the following information as is available and applicable:

(i) Aircraft serial number.

[(ii) When the failure, malfunction, or defect is associated with an article approved under a TSO authorization, the article serial number and model designation, as appropriate.

[(iii) When the failure, malfunction, or defect is associated with an engine or propeller, the engine or propeller serial number, as appropriate.

[(iv) Product model.

[(v) Identification of the part, component, or system involved. The identification must include the part number.

[(vi) Nature of the failure, malfunction, or defect.

[(f) Whenever the investigation of an accident or service difficulty report shows that an article manufactured under a TSO authorization is unsafe because of a manufacturing or design defect, the manufacturer shall, upon request of the Administrator, report to the Administrator the results of its investigation and any action taken or proposed by the manufacturer to correct that defect. If action is required to correct the defect in existing articles, the manufacturer shall submit the data necessary for the issuance of an appropriate airworthiness directive to the Chief, Engineering and Manufacturing Branch (or in the case of the Western Region, the Chief, Aircraft Engineering Division), of the FAA regional office in the region in which it is located.]

§ 21.5 Airplane or Rotorcraft Flight Manual.

(a) With each airplane or rotorcraft that was not type certificated with an Airplane or Rotorcraft Flight Manual and that has had no flight time prior to March 1, 1979, the holder of a Type Certificate (including a Supplemental Type Certificate) or the licensee of a Type Certificate shall make available to the owner at the time of delivery of the aircraft a current approved Airplane or Rotorcraft Flight Manual.

(b) The Airplane or Rotorcraft Flight Manual required by paragraph (a) of this section must contain the following information:

(1) The operating limitations and information required to be furnished in an Airplane or Rotorcraft Flight Manual or in manual material, markings, and placards, by the applicable regulations under which the airplane or rotorcraft was type certificated.

(2) The maximum ambient atmospheric temperature for which engine cooling was demonstrated must be stated in the performance information section of the Flight Manual, if the applicable regulations under which the aircraft was type certificated do not require ambient temperature or engine cooling operating limitations in the Flight Manual.

Subpart B—Type Certificates

§ 21.11 Applicability.

This subpart prescribes—

(a) Procedural requirements for the issue of type certificates for aircraft, aircraft engines, and propellers; and

(b) Rules governing the holders of those certificates.

§ 21.13 Eligibility.

Any interested person may apply for a type certificate.

§ 21.15 Application for type certificate.

(a) An application for a type certificate is made on a form and in a manner prescribed by the Administrator and is submitted to the appropriate FAA regional office.

(b) An application for an aircraft type certificate must be accompanied by a three-view drawing of that aircraft and available preliminary basic data.

(c) An application for an aircraft engine type certificate must be accompanied by a description of the engine design features, the engine operating characteristics, and the proposed engine operating limitations.

§ 21.16 Special conditions.

[If the Administrator finds that the airworthiness regulations of this subchapter do not contain adequate or appropriate safety standards for an aircraft, aircraft engine, or propeller because of a novel or unusual design feature of the aircraft, aircraft engine or propeller, he prescribes special conditions and amendments thereto for the product. The special conditions are issued in accordance with Part 11 of this chapter and contain such safety standards for the aircraft, aircraft engine or propeller as the Administrator finds necessary to establish a level of safety equivalent to that established in the regulations.]

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§ 21.17 Designation of applicable regulations.

(a) Except as provided in § 23.2, § 25.2 and in Part 36 of this chapter, an applicant for a type certificate must show that the aircraft, aircraft engine, or propeller concerned meets—

(1) The applicable requirements of this subchapter that are effective on the date of application for that certificate unless—

(i) Otherwise specified by the Administrator; or

(ii) Compliance with later effective amendments is elected or required under this section; and

(2) Any special conditions prescribed by the Administrator.

[(b) For special classes of aircraft, including the engines and propellers installed thereon (e.g., gliders, airships, and other nonconventional aircraft), for which airworthiness standards have not been issued under this subchapter, the applicable requirements will be the portions of those airworthiness requirements contained in Part 23, 25, 27, 29, 31, 33, and 35 found by the Administrator to be appropriate for the aircraft and applicable to a specific type design, or such other airworthiness criteria as the Administrator may find provide an equivalent level of safety to those parts.]

(c) An application for type certification of a transport category aircraft is effective for five years and an application for any other type certificate is effective for three years, unless an applicant shows at the time of application that his product requires a longer period of time for design, development, and testing, and the Administrator approves a longer period.

(d) In a case where a type certificate has not been issued, or it is clear that a type certificate will not be issued, within the time limit established under paragraph (c) of this section, the applicant may—

(1) File a new application for a type certificate and comply with all the provisions of paragraph (a) applicable to an original application; or

(2) File for an extension of the original application and comply with the applicable airworthiness requirements of this subchapter that were effective on a date, to be selected by the applicant, not earlier than the date which precedes the date of issue of the type certificate by the time limit established under paragraph (c) for the original application.

(e) If an applicant elects to comply with an amendment to this subchapter that is effective after the filing of the application for a type certificate, he must also comply with any other amendment that the Administrator finds is directly related.

§ 21.19 Changes requiring a new type certificate.

Any person who proposes to change a product must make a new application for a type certificate if—

(a) The Administrator finds that the proposed change in design, configuration, power, power limitations (engines), speed limitations (engines), or weight is so extensive that a substantially complete investigation of compliance with the applicable regulations is required;

(b) In the case of a normal, utility, acrobatic, commuter, or transport category aircraft, the proposed change is—

(1) In the number of engines or rotors; or

(2) To engines or rotors using different principles of propulsion or to rotors using different principles of operation.

(c) In the case of an aircraft engine, the proposed change is in the principle of operation; or

(d) In the case of propellers, the proposed change is in the number of blades or principle of pitch change operation.

§ 21.21 [Issue of type certificate: normal, utility, acrobatic, commuter, and transport category aircraft; manned free balloons; special classes of aircraft; aircraft engines; propellers.]

[An applicant is entitled to a type certificate for an aircraft in the normal, utility, acrobatic, commuter, or transport category, or for a manned free balloon, special class of aircraft, or an aircraft engine or propeller, if—]

(a) The product qualifies under § 21.27, or

(b) The applicant submits the type design, test reports, and computations necessary to show that the product to be certificated meets the applicable airworthiness and aircraft noise requirements of the Federal Aviation Regulations and any special conditions prescribed by the Administrator, and the Administrator finds—

(1) Upon examination of the type design, and after completing all tests and inspections, that the type design and the product meet the applicable aircraft noise requirements of the Federal Aviation Regulations, and further finds that they meet the applicable airworthiness requirements of the Federal Aviation Regulations or that any airworthiness provisions not complied with are compensated for by factors that provide an equivalent level of safety; and

(2) For an aircraft, that no feature or characteristic makes it unsafe for the category in which certification is requested.

§ 21.23 [[Reserved]]

§ 21.25 Issue of type certificate: restricted category aircraft.

(a) An applicant is entitled to a type certificate for an aircraft in the restricted category for special purpose operations if he shows compliance with the applicable noise requirements of Part 36 of this chapter, and if he shows that no feature or characteristic of the aircraft makes it unsafe when it is operated under the limitations prescribed for its intended use, and that the aircraft—

(1) Meets the airworthiness requirements of an aircraft category except those requirements that the Administrator finds inappropriate for the special purpose for which the aircraft is to be used; or

(2) Is of a type that has been manufactured in accordance with the requirements of and accepted for use by, an Armed Force of the United States and has been later modified for a special purpose.

(b) For the purposes of this section, "special purposes operations" includes—

(1) Agricultural (spraying, dusting, and seeding, and lifestock and predatory animal control);

(2) Forest and wildlife conservation;

(3) Aerial surveying (photography, mapping, and oil and mineral exploration);

(4) Patrolling (pipelines, power lines, and canals);

(5) Weather control (cloud seeding);

(6) Aerial advertising (skywriting, banner towing, airborne signs and public address systems); and

(7) Any other operation specified by the Administrator.

§ 21.27 Issue of type certificate: surplus aircraft of the Armed Forces.

(a) Except as provided in paragraph (b) of this section, an applicant is entitled to a type certificate for an aircraft in the normal, utility, acrobatic, commuter, or transport category that was designed and constructed in the United States, accepted for operational use, and declared surplus by, an Armed Force of the United States, and that is shown to comply with the applicable certification requirements in paragraph (f) of this section.

(b) An applicant is entitled to a type certificate for a surplus aircraft of the Armed Forces of the United States that is a counterpart of a previously type certificated civil aircraft, if he shows compliance with the regulations governing the original civil aircraft type certificate.

(c) Aircraft engines, propellers, and their related accessories installed in surplus Armed Forces aircraft, for which a type certificate is sought under this section, will be approved for use on those aircraft if the applicant shows that on the basis of the previous military qualifications acceptance, and service record, the product provides substantially the same level of airworthiness as would be provided if the engines or propellers were type certificated under Parts 33 or 35 of the Federal Aviation Regulations.

(d) The Administrator may relieve an applicant from strict compliance with a specific provision of the applicable requirements in paragraph (f) of this section, if the Administrator finds that the method of compliance proposed by the applicant provides substantially the same level of airworthiness and that strict compliance with those regulations would impose a severe burden on the applicant. The Administrator may use experience that was satisfactory to an Armed Force of the United States in making such a determination.

(e) The Administrator may require an applicant to comply with special conditions and later requirements than those in paragraphs (c) and (f) of this section, if the Administrator finds that compliance with the listed regulations would not ensure an adequate level of airworthiness for the aircraft.

(f) Except as provided in paragraphs (b) through (e) of this section, an applicant for a type certificate under this section must comply with the appropriate regulations listed in the following table:

Type of aircraft	*Date accepted for operational use by the Armed Force of the United States*	*Regulations that apply*[1]
Small reciprocating-engine powered airplanes	Before May 16, 1956 After May 15, 1956	CAR Part 3, as effective May 15, 1956. CAR Part 3 or FAR Part 23.
Small turbine-engine powered airplanes	Before Oct. 2, 1959 After Oct. 1, 1959	CAR Part 3, as effective Oct. 1, 1959. CAR Part 3 or FAR Part 23.
[Commuter category airplanes	[After Feb. 17, 1987	[FAR Part 23 as of Feb. 17, 1987.]
Large reciprocating-engine powered airplanes	Before Aug. 26, 1955 After Aug. 25, 1955	CAR Part 4b, as effective Aug. 25, 1955. CAR Part 4b or FAR Part 25.
Large turbine engine-powered airplanes	Before Oct. 2 1959 After Oct. 1, 1959	CAR Part 4b, as effective Oct. 1, 1959. CAR Part 4b or FAR Part 25.
Rotorcraft with maximum certificated takeoff weight of:		
6,000 pounds or less	Before Oct. 2, 1959 After Oct. 1, 1959	CAR Part 6, as effective Oct. 1, 1959. CAR Part 6 or FAR Part 27.
Over 6,000 pounds	Before Oct. 2, 1959 After Oct. 1, 1959	CAR Part 7, as effective Oct. 1, 1959. CAR Part 7 or FAR Part 29.

[1] Where no specific date is listed, the applicable regulations are those in effect on the date that the first aircraft of the particular model was accepted for operational use by the Armed Force.

§ 21.29 Issue of type certificate: import products.

(a) A type certificate may be issued for a product that is manufactured in a foreign country with which the United States has an agreement for the acceptance of these products for export and import and that is to be imported into the United States if—

(1) The country in which the product was manufactured certifies that the product

has been examined, tested and found to meet—

(i) The applicable aircraft noise requirements of this subchapter as designated in § 21.17 or the applicable aircraft noise requirements of the country in which the product was manufactured and any other requirements the Administrator may prescribe to provide noise levels no greater than those provided by the applicable aircraft noise requirements of this subchapter as designated in § 21.17; and

(ii) The applicable airworthiness requirements of this subchapter as designated in § 21.17, or the applicable airworthiness requirements of the country in which the product was manufactured and any other requirements the Administrator may prescribe to provide a level of safety equivalent to that provided by the applicable airworthiness requirements of this subchapter as designated in § 21.17;

(2) The applicant has submitted the technical data, concerning aircraft noise and airworthiness, respecting the product required by the Administrator; and

(3) The manuals, placards, listings, and instrument markings required by the applicable airworthiness (and noise, where applicable) requirements are presented in the English language.

(b) A product type certificated under this section is considered to be type certificated under the noise standards of Part 36 of the Federal Aviation Regulations where compliance therewith is certified under paragraph (a) (1) (i) of this section, and under the airworthiness standards of that Part of the Federal Aviation Regulations with which compliance is certified under paragraph (a) (1) (ii) of this section or to which an equivalent level of safety is certified under paragraph (a) (1) (ii) of this section.

§ 21.31 Type design.

The type design consists of—

(a) The drawings and specifications, and a listing of those drawings and specifications, necessary to define the configuration and the design features of the product shown to comply with the requirements of that part of this subchapter applicable to the product;

(b) Information on dimensions, materials, and processes necessary to define the structural strength of the product;

[(c) The Airworthiness Limitations section of the Instructions for Continued Airworthiness as required by Parts 23, 25, 27, 29, 31, 33, and 35 of this chapter, and as specified in the applicable airworthiness criteria for special classes of aircraft defined in § 21.17(b); and]

(d) Any other data necessary to allow, by comparison, the determination of the airworthiness and noise characteristics (where applicable) of later products of the same type.

§ 21.33 Inspection and tests.

(a) Each applicant must allow the Administrator to make any inspection and any flight and ground test necessary to determine compliance with the applicable requirements of the Federal Aviation Regulations. However, unless otherwise authorized by the Administrator—

(1) No aircraft, aircraft engine, propeller, or part thereof may be presented to the Administrator for test unless compliance with paragraphs (b) (2) through (b) (4) of this section has been shown for that aircraft, aircraft engine, propeller, or part thereof; and

(2) No change may be made to an aircraft, aircraft engine, propeller, or part thereof between the time that compliance with paragraphs (b) (2) through (b) (4) of this section is shown for that aircraft, aircraft engine, propeller, or part thereof and the time that it is presented to the Administrator for test.

(b) Each applicant must make all inspections and tests necessary to determine—

(1) Compliance with the applicable airworthiness and aircraft noise requirements;

(2) That materials and products conform to the specifications in the type design;

(3) That parts of the products conform to the drawings in the type design; and

(4) That the manufacturing processes, construction and assembly conform to those specified in the type design.

§ 21.35 Flight tests.

(a) Each applicant for an aircraft type certificate (other than under §§ 21.25 through 21.29) must make the tests listed in paragraph

(b) of this section. Before making the tests the applicant must show—

(1) Compliance with the applicable structural requirements of this subchapter;

(2) Completion of necessary ground inspections and tests;

(3) That the aircraft conforms with the type design; and

(4) That the Administrator received a flight test report from the applicant (signed, in the case of aircraft to be certificated under Part 25 of this chapter, by the applicant's test pilot) containing the results of his tests.

(b) Upon showing compliance with paragraph (a) of this section, the applicant must make all flight tests that the Administrator finds necessary—

(1) To determine compliance with the applicable requirements of this subchapter; and

(2) For aircraft to be certificated under this subchapter, except gliders and except airplanes of 6,000 lbs. or less maximum certificated weight that are to be certificated under Part 23 of this chapter, to determine whether there is reasonable assurance that the aircraft, its components, and its equipment are reliable and function properly.

(c) Each applicant must, if practicable, make the tests prescribed in paragraph (b) (2) of this section upon the aircraft that was used to show compliance with—

(1) Paragraph (b) (1) of this section; and

(2) For rotorcraft, the rotor drive endurance tests prescribed in § 27.923 or § 29.923 of this chapter, as applicable.

(d) Each applicant must show for each flight test (except in a glider or a manned free balloon) that adequate provision is made for the flight test crew for emergency egress and the use of parachutes.

(e) Except in gliders and manned free balloons, an applicant must discontinue flight tests under this section until he shows that corrective action has been taken, whenever—

(1) The applicant's test pilot is unable or unwilling to make any of the required flight tests; or

(2) Items of noncompliance with requirements are found that may make additional test data meaningless or that would make further testing unduly hazardous.

(f) The flight tests prescribed in paragraph (b) (2) of this section must include—

(1) For aircraft incorporating turbine engines of a type not previously used in a type certificated aircraft, at least 300 hours of operation with a full complement of engines that conform to a type certificate; and

(2) For all other aircraft, at least 150 hours of operation.

§ 21.37 Flight test pilot.

Each applicant for normal, utility, acrobatic, [commuter,] or transport category aircraft type certificate must provide a person holding an appropriate pilot certificate to make the flight tests required by this Part.

§ 21.39 Flight test instrument calibration and correction report.

(a) Each applicant for a normal, utility, acrobatic, [commuter,] or transport category aircraft type certificate must submit a report to the Administrator showing the computations and tests required in connection with the calibration of instruments used for test purposes and in the correction of test results to standard atmospheric conditions.

(b) Each applicant must allow the Administrator to conduct any flight tests that he finds necessary to check the accuracy of the report submitted under paragraph (a) of this section.

§ 21.41 Type certificate.

Each type certificate is considered to include the type design, the operating limitations, the certificate data sheet, the applicable regulations of this subchapter with which the Administrator records compliance, and any other conditions or limitations prescribed for the product in this subchapter.

§ 21.43 Location of manufacturing facilities.

Except as provided in § 21.29, the Administrator does not issue a type certificate if the manufacturing facilities for the product are located outside of the United States, unless the Administrator finds that the location of the manufacturer's facilities places no undue burden on the FAA in administering applicable airworthiness requirements.

§ 21.45 Privileges.

The holder or licensee of a type certificate for a product may—

(a) In the case of aircraft, upon compliance with §§ 21.173 through 21.189, obtain airworthiness certificates;

(b) In the case of aircraft engines, or propellers, obtain approval for installation on certificated aircraft;

(c) In the case of any product, upon compliance with §§ 21.133 through 21.163, obtain a production certificate for the type certificated product; and

(d) Obtain approval of replacement parts for that product.

§21.47 Transferability.

A type certificate may be transferred to or made available to third persons by licensing agreements. Each grantor shall, within 30 days after the transfer of a certificate or execution or termination of a licensing agreement, notify in writing the appropriate FAA Regional Office. The notification must state the name and address of the transferee or licensee, date of the transaction, and in the case of a licensing agreement, the extent of authority granted the licensee.

§ 21.49 Availability.

The holder of a type certificate shall make the certificate available for examination upon the request of the Administrator or the National Transportation Safety Board.

§ 21.50 Instructions for Continued Airworthiness and Manufacturer's Maintenance Manuals having Airworthiness Limitations sections.

(a) The holder of a type certificate for a rotorcraft for which a Rotorcraft Maintenance Manual containing an "Airworthiness Limitations" section has been issued under § 27.1529(a) (2) or § 29.1529(a) (2), and who obtains approval of changes to any replacement time, inspection interval, or related procedure in that section of the manual, shall make those changes available upon request to any operator of the same type of rotorcraft.

[(b) The holder of design approval, including either the type certificate or supplemental type certificate for an aircraft, aircraft engine, or propeller for which application was made after January 28, 1981, shall furnish at least one set of complete Instructions for Continued Airworthiness, prepared in accordance with §§ 23.1529, 25.1529, 27.1529, 29.1529, 31.82, 33.4, or 35.4 of this chapter, or as specified in the applicable airworthiness criteria for special classes of aircraft defined in § 21.17(b), as applicable, to the owner of each type aircraft, aircraft engine, or propeller upon its delivery, or upon issuance of the first standard airworthiness certificate of airworthiness for the affected aircraft, whichever occurs later, and thereafter make those instructions available to any other person required by this chapter to comply with any of the terms of those instructions. In addition, changes to the Instructions for Continued Airworthiness shall be made available to any person required by this chapter to comply with any of those instructions.]

§ 21.51 Duration.

A type certificate is effective until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator.

§ 21.53 Statement of conformity.

(a) Each applicant must submit a statement of conformity (FAA Form 317) to the Administrator for each aircraft engine and propeller presented to the Administrator for type certification. This statement of conformity must include a statement that the aircraft engine or propeller conforms to the type design therefor.

(b) Each applicant must submit a statement of conformity to the Administrator for each aircraft or part thereof presented to the Administrator for tests. This statement of conformity must include a statement that the applicant has complied with § 21.33(a) (unless otherwise authorized under that paragraph).

Subpart C—Provisional Type Certificates

§ 21.71 Applicability.

This subpart prescribes—

(a) Procedural requirements for the issue of provisional type certificates, amendments to provisional type certificates, and provisional amendments to type certificates; and

(b) Rules governing the holders of those certificates.

§ 21.73 Eligibility.

(a) Any manufacturer of aircraft manufactured within the United States who is a United States citizen may apply for Class I or Class II provisional type certificates, for amendments to provisional type certificates held by him, and for provisional amendments to type certificates held by him.

(b) Any manufacturer of aircraft manufactured in a foreign country with which the United States has an agreement for the acceptance of those aircraft for export and import may apply for a Class II provisonal type certificate, for amendments to provisional type

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certificates held by him, and for provisional amendments to type certificates held by him.

(c) An aircraft engine manufacturer who is a United States citizen and who has altered a type certificated aircraft by installing different type certificated aircraft engines manufactured by him within the United States may apply for a Class I provisional type certificate for the aircraft, and for amendments to Class I provisional type certificates held by him, if the basic aircraft, before alteration, was type certificated in the normal, utility, acrobatic, [commuter,] or transport category.

§ 21.75 Application.

Applications for provisional type certificates, for amendments thereto, and for provisional amendments to type certificates must be submitted to the Chief, Engineering and Manufacturing Branch, Flight Standards Division, of the region in which the applicant is located, (or, in the case of the Western Region, the Chief, Aircraft Engineering Division and in the case of the European, African and Middle East Region, the Chief, Aircraft Certification Staff) and must be accompanied by the pertinent information specified in this subpart.

§ 21.77 Duration.

(a) Unless sooner surrendered, superseded, revoked, or otherwise terminated, provisional type certificates and amendments thereto are effective for the periods specified in this section.

(b) A Class I provisional type certificate is effective for 24 months after the date of issue.

(c) A Class II provisional type certificate is effective for twelve months after the date of issue.

(d) An amendment to a Class I or Class II provisional type certificate is effective for the duration of the amended certificate.

(e) A provisional amendment to a type certificate is effective for six months after its approval or until the amendment of the type certificate is approved, whichever is first.

§ 21.79 Transferability.

Provisional type certificates are not transferable.

§ 21.81 Requirements for issue and amendment of Class I provisional type certificates.

(a) An applicant is entitled to the issue or amendment of a Class I provisional type certificate if he shows compliance with this section and the Administrator finds that there is no feature, characteristic, or condition that would make the aircraft unsafe when operated in accordance with the limitations established in paragraph (e) of this section and in § 91.41 of this chapter.

(b) The applicant must apply for the issue of a type or supplemental type certificate for the aircraft.

(c) The applicant must certify that—

(1) The aircraft has been designed and constructed in accordance with the airworthiness requirements applicable to the issue of the type or supplemental type certificate applied for;

(2) The aircraft substantially meets the applicable flight characteristic requirements for the type or supplemental type certificate applied for; and

(3) The aircraft can be operated safely under the appropriate operating limitations specified in paragraph (a) of this section.

(d) The applicant must submit a report showing that the aircraft had been flown in all maneuvers necessary to show compliance with the flight requirements for the issue of the type or supplemental type certificate applied for, and to establish that the aircraft can be operated safely in accordance with the limitations contained in this subchapter.

(e) The applicant must establish all limitations required for the issue of the type or supplemental type certificate applied for, including limitations on weights, speeds, flight maneuvers, loading, and operation of controls and equipment unless, for each limitation not so established, appropriate operating restrictions are established for the aircraft.

(f) The applicant must establish an inspection and maintenance program for the continued airworthiness of the aircraft.

(g) The applicant must show that a prototype aircraft has been flown for at least 50 hours under an experimental certificate issued under §§ 21.191 through 21.195, or under the auspices of an Armed Force of the United States. However, in the case of an amendment to a provisional type certificate, the Administrator may reduce the number of required flight hours.

§ 21.83 Requirements for issue and amendment of Class II provisional type certificates.

(a) An applicant who manufactures aircraft within the United States is entitled to the issue or amendment of a Class II provisional type certificate if he shows compliance with this section and the Administrator finds that there is no feature, characteristic, or condition that would make the aircraft unsafe when operated in accordance with the limitations in paragraph (h) of this section, and §§ 91.41 and 121.207 of this chapter.

(b) An applicant who manufactures aircraft in a country with which the United States has an agreement for the acceptance of those aircraft for export and import is entitled to the issue or amendment of a Class II provisional type certificate if the country in which the aircraft was manufactured certifies that the applicant has shown compliance with this section, that the aircraft meets the requirements of paragraph (f) of this section and that there is no feature, characteristic, or condition that would make the aircraft unsafe when operated in accordance with the limitations in paragraph (h) of this section and §§ 91.41 and 121.207 of this chapter.

(c) The applicant must apply for a type certificate, in the transport category, for the aircraft.

(d) The applicant must hold a U.S. type certificate for at least one other aircraft in the same transport category as the subject aircraft.

(e) The FAA's official flight test program or the flight test program conducted by the authorities of the country in which the aircraft was manufactured, with respect to the issue of a type certificate for that aircraft, must be in progress.

(f) The applicant or, in the case of a foreign manufactured aircraft, the country in which the aircraft was manufactured, must certify that—

(1) The aircraft has been designed and constructed in accordance with the airworthiness requirements applicable to the issue of the type certificate applied for;

(2) The aircraft substantially complies with the applicable flight characteristic requirements for the type certificate applied for; and

(3) The aircraft can be operated safely under the appropriate operating limitations in this subchapter.

(g) The applicant must submit a report showing that the aircraft has been flown in all maneuvers necessary to show compliance with the flight requirements for the issue of the type certificate and to establish that the aircraft can be operated safely in accordance with the limitations in this subchapter.

(h) The applicant must prepare a provisional aircraft flight manual containing all limitations required for the issue of the type certificate applied for, including limitations on weights, speeds, flight maneuvers, loading, and operation of controls and equipment unless, for each limitation not so established, appropriate operating restrictions are established for the aircraft.

(i) The applicant must establish an inspection and maintenance program for the continued airworthiness of the aircraft.

(j) The applicant must show that a prototype aircraft has been flown for at least 100 hours. In the case of an amendment to a provisional type certificate, the Administrator may reduce the number of required flight hours.

§ 21.85 Provisional amendments to type certificates.

(a) An applicant who manufactures aircraft within the United States is entitled to a provisional amendment to a type certificate if he shows compliance with this section and the Administrator finds that there is no feature, characteristic, or condition that would make the aircraft unsafe when operated under the appropriate limitations contained in this subchapter.

(b) An applicant who manufactures aircraft in a foreign country with which the United States has an agreement for the acceptance of those aircraft for export and import is entitled to a provisional amendment to a type certificate if the country in which the aircraft was manufactured certifies that the applicant has shown compliance with this section, that the aircraft meets the requirements of paragraph (e) of this section and that there is no feature, characteristic, or condition that would make the aircraft unsafe when operated under the appropriate limitations contained in this subchapter.

(c) The applicant must apply for an amendment to the type certificate.

(d) The FAA's official flight test program or the flight test program conducted by the authorities of the country in which the aircraft was manufactured, with respect to the amendment of the type certificate, must be in progress.

(e) The applicant or, in the case of foreign manufactured aircraft, the country in which the aircraft was manufactured, must certify that—

(1) The modification involved in the amendment to the type certificate has been designed and constructed in accordance with the airworthiness requirements applicable to the issue of the type certificate for the aircraft;

(2) The aircraft substantially complies with the applicable flight characteristic requirements for the type certificate; and

(3) The aircraft can be operated safely under the appropriate operating limitations in this subchapter.

(f) The applicant must submit a report showing that the aircraft incorporating the modifications involved has been flown in all maneuvers necessary to show compliance with the flight requirements applicable to those modifications and to establish that the aircraft can be operated safely in accordance with the limitations specified in § 91.41 and § 121.207 of this chapter.

(g) The applicant must establish and publish, in a provisional aircraft flight manual or other document and on appropriate placards, all limitations required for the issue of the type certificate applied for, including weight, speed, flight maneuvers, loading, and operation of controls and equipment, unless, for each limitation not so established, appropriate operating restrictions are established for the aircraft.

(h) The applicant must establish an inspection and maintenance program for the continued airworthiness of the aircraft.

(i) The applicant must operate a prototype aircraft modified in accordance with the corresponding amendment to the type certificate for the number of hours found necessary by the Administrator.

Subpart D—Changes to Type Certificates

§ 21.91 Applicability.

This subpart prescribes procedural requirements for the approval of changes to type certificates.

§ 21.93 Classification of changes in type design.

(a) In addition to changes in type design specified in paragraph (b) of this section, changes in type design are classified as minor and major. A "minor change" is one that has no appreciable effect on the weight, balance, structural strength, reliability, operational characteristics, or other characteristics affecting the airworthiness of the product. All other changes are "major changes" (except as provided in paragraph (b) of this section).

(b) [For the purpose of complying with Part 36 of this chapter, and except as provided in paragraphs (b)(2), (b)(3), and (b)(4) of this section, any voluntary change in the type design of an aircraft that may increase the noise levels of that aircraft is an "acoustical change" (in addition to being a minor or major change as classified in paragraph (a) of this section) for the following aircraft:

(1) Transport category large airplanes.

(2) Turbojet powered airplanes (regardless of category). For airplanes to which this paragraph applies, "acoustical changes" do not include changes in type design that are limited to one of the following—

(i) Gear down flight with one or more retractable landing gear down during the entire flight, or

(ii) Spare engine and nacelle carriage external to the skin of the airplane (and return of the pylon or other external mount), or

(iii) Time-limited engine and/or nacelle changes, where the change in type design specifies that the airplane may not be operated for a period of more than 90 days unless compliance with the applicable acoustical change provisions of Part 36 of this chapter is shown for that change in type design.

(3) [Propeller driven commuter category and small airplanes in the normal, utility, acrobatic, transport, and restricted categories, except for airplanes that are:

[(i) Designated for "agricultural aircraft operations" (as defined in § 137.3 of this chapter, effective January 1, 1966) to which § 36.1583 of this chapter does not apply, or

[(ii) Designated for dispensing fire fighting materials to which § 36.1583 of this chapter does not apply, or

[(iii) U.S. registered, and that had flight time prior to January 1, 1955 or

[(iv) Land configured aircraft reconfigured with floats or skis. This reconfiguration does not permit further exception from the requirements of the section upon any acoustical change not enumerated in § 21.93(b).]

(4) Helicopters, (except for those helicopters that are designated exclusively for "agricultural aircraft operations", as defined in § 137.3 of this chapter, as effective on January 1, 1966, for dispensing fire fighting materials, or for carrying external loads, as defined in § 133.1(b) of this chapter, as effective on December 20, 1976). For helicopters to which this paragraph applies, "acoustical changes" include the following type design changes:

(i) Any changes to, or removal of, a muffler or other component designed for noise control.

(ii) Any other design or configuration change (including a change in the operating limitations of the aircraft) that, based on FAA-approved analytical or test data, the Administrator determines may result in an increase in noise level.

§ 21.95 Approval of minor changes in type design.

Minor changes in a type design may be approved under a method acceptable to the Administrator before submitting to the Administrator any substantiating or descriptive data.

§ 21.97 Approval of major changes in type design.

(a) In the case of a major change in type design, the applicant must submit substantiating data and necessary descriptive data for inclusion in the type design.

(b) Approval of a major change in the type design of an aircraft engine is limited to the specific engine configuration upon which the change is made unless the applicant identifies in the necessary descriptive data for inclusion in the type design the other configurations of the same engine type for which approval is requested and shows that the change is compatible with the other configurations.

§ 21.99 Required design changes.

(a) When an Airworthiness Directive is issued under Part 39 the holder of the type certificate for the product concerned must—

(1) If the Administrator finds that design changes are necessary to correct the unsafe condition of the product, and upon his request, submit appropriate design changes for approval; and

(2) Upon approval of the design changes, make available the descriptive data covering the changes to all operators of products previously certificated under the type certificate.

(b) In a case where there are no current unsafe conditions, but the Administrator or the holder of the type certificate finds through service experience that changes in type design will contribute to the safety of the product, the holder of the type certificate may submit appropriate design changes for approval. Upon approval of the changes, the manufacturer shall make information on the design changes available to all operators of the same type of product.

§ 21.101 Designation of applicable regulations.

(a) Except as provided in § 23.2, § 25.2 and Part 36 of this chapter, an applicant for a change to a type certificate must comply with either—

(1) The regulations incorporated by reference in the type certificate; or

(2) The applicable regulations in effect on the date of the application, plus any other amendments the Administrator finds to be directly related.

(b) If the Administrator finds that a proposed change consists of a new design or a substantially complete redesign of a component, equipment installation, or system installation, and that the regulations incorporated by reference in the type certificate for the product do not provide adequate standards with respect to the proposed change, the applicant must comply with—

(1) The applicable provisions of this subchapter, in effect on the date of the application for the change, that the Administrator finds necessary to provide a level of safety equal to that established by the regulations incorporated by reference in the type certificate for the product; and

(2) Any special conditions, and amendments to those special conditions, prescribed by the Administrator to provide a level of safety equal to that established by the regulations incorporated by reference in the type certificate for the product.

(c) Unless otherwise required by § 21.19(a), an applicant for a change to a type certificate for a transport category airplane involving the replacement of reciprocating engines with the same number of turbo-propeller powerplants must comply with the requirements of Part 25 of this chapter applicable to the airplane as type certificated with reciprocating engines, and with the following:

(1) The certification performance requirements prescribed in §§ 25.101 through 25.125, and 25.149, 25.1533, 25.1583, and 25.1587.

(2) The powerplant requirements of Part 25 of this chapter applicable to turbo-propeller engine-powered airplanes.

(3) The requirements of Part 25 of this chapter for the standardization of cockpit controls and instruments, unless the Administrator finds that compliance with a particular detailed requirement would be impractical and would not contribute materially to standardization.

(4) Any other requirement of Part 25 of this chapter applicable to turbo-propeller engine-powered airplanes that the Administrator finds to be related to the changes in engines and that are necessary to ensure a level of safety equal to that of the airplane certificated with reciprocating engines.

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For each new limitation established with respect to weight, speed, or altitude that is significantly altered from those approved for the airplane with reciprocating engines, the applicant must show compliance with the requirements of Part 25 of this chapter applicable to the limitations being changed.

Subpart E—Supplemental Type Certificates

§ 21.111 Applicability.

This subpart prescribes procedural requirements for the issue of supplemental type certificates.

§ 21.113 Requirement of supplemental type certificate.

Any person who alters a product by introducing a major change in type design, not great enough to require a new application for a type certificate under § 21.19, shall apply to the Administrator for a supplemental type certificate, except that the holder of a type certificate for the product may apply for amendment of the original type certificate. The application must be made in a form and manner prescribed by the Administrator.

§ 21.115 Applicable requirements.

(a) Each applicant for a supplemental type certificate must show that the altered product meets applicable airworthiness requirements as specified in paragraphs (a) and (b) of § 21.101 and, in the case of an acoustical change described in § 21.93(b), show compliance with the applicable noise requirements of [§§ 36.7, 36.9, or 36.11 of this chapter].

(b) Each applicant for a supplemental type certificate must meet §§ 21.33 and 21.53 with respect to each change in the type design.

§ 21.117 Issue of supplemental type certificates.

(a) An applicant is entitled to a supplemental type certificate if he meets the requirements of §§ 21.113 and 21.115.

(b) A supplemental type certificate consists of—

(1) The approval by the Administrator of a change in the type design of the product; and

(2) The type certificate previously issued for the product.

§ 21.119 Privileges.

The holder of a supplemental type certificate may—

(a) In the case of aircraft, obtain airworthiness certificates;

(b) In the case of other products, obtain approval for installation on certificated aircraft; and

(c) Obtain a production certificate for the change in the type design that was approved by that supplemental type certificate.

Subpart F—Production Under Type Certificate Only

§ 21.121 Applicability.

This subpart prescribes rules for production under a type certificate only.

§ 21.123 Production under type certificate.

Each manufacturer of a product being manufactured under a type certificate only shall—

(a) Make each product available for inspection by the Administrator;

(b) Maintain at the place of manufacture the technical data and drawings necessary for the Administrator to determine whether the product and its parts conform to the type design;

(c) Except as otherwise authorized by the Regional Director in the region in which the manufacturer is located, for products manufactured more than 6 months after the date of issue of the type certificate, establish and maintain an approved production inspection system that ensures that each product conforms to the type design and is in condition for safe operation; and

(d) Upon the establishment of the approved production inspection system (as required by paragraph (c) of this section) submit to the Administrator a manual that describes that system and the means for making the determinations required by § 21.125(b).

§ 21.125 Production inspection system: Materials Review Board.

(a) Each manufacturer required to establish a production inspection system by § 21.123 (c) shall—

(1) Establish a Materials Review Board (to include representatives from the inspection and engineering departments) and materials review procedures; and

(2) Maintain complete records of Materials Review Board action for at least two years.

(b) The production inspection system required in § 21.123 (c) must provide a means for determining at least the following:

(1) Incoming materials, and bought or subcontracted parts, used in the finished product must be as specified in the type design data, or must be suitable equivalents.

(2) Incoming materials, and bought or subcontracted parts, must be properly identified if their physical or chemical properties cannot be readily and accurately determined.

(3) Materials subject to damage and deterioration must be suitably stored and adequately protected.

(4) Processes affecting the quality and safety of the finished product must be accomplished in accordance with acceptable industry or United States specifications.

(5) Parts and components in process must be inspected for conformity with the type design data at points in production where accurate determinations can be made.

(6) Current design drawings must be readily available to manufacturing and inspection personnel, and used when necessary.

(7) Design changes, including material substitutions, must be controlled and approved before being incorporated in the finished product.

(8) Rejected materials and parts must be segregated and identified in a manner that precludes installation in the finished product.

(9) Materials and parts that are withheld because of departures from design data or specifications, and that are to be considered for installation in the finished product, must be processed through the Materials Review Board. Those materials and parts determined by the Board to be serviceable must be properly identified and reinspected if rework or repair is necessary. Materials and parts rejected by the Board must be marked and disposed of to ensure that they are not incorporated in the final product.

(10) Inspection records must be maintained, identified with the completed product where practicable, and retained by the manufacturer for at least two years.

§ 21.127 Tests: aircraft.

(a) Each person manufacturing aircraft under a type certificate only shall establish an approved production flight test procedure and flight check-off form, and in accordance with that form, flight test each aircraft produced.

(b) Each production flight test procedure must include the following:

(1) An operational check of the trim, controllability, or other flight characteristics to establish that the production aircraft has the same range and degree of control as the prototype aircraft.

(2) An operational check of each part or system operated by the crew while in flight to establish that, during flight, instrument readings are within normal range.

(3) A determination that all instruments are properly marked, and that all placards and required flight manuals are installed after flight test.

(4) A check of the operational characteristics of the aircraft on the ground.

(5) A check on any other items peculiar to the aircraft being tested that can best be done during the ground or flight operation of the aircraft.

§ 21.128 Tests: aircraft engines.

(a) Each person manufacturing aircraft engines under a type certificate only shall subject each engine (except rocket engines for which the manufacturer must establish a sampling technique) to an acceptable test run that includes the following:

(1) Break-in runs that include a determination of fuel and oil consumption and a

determination of power characteristics at the rated maximum continuous power or thrust and, if applicable, at rated takeoff power or thrust.

(2) At least five hours of operation at rated maximum continuous power or thrust. For engines having a rated takeoff power or thrust higher than rated maximum continuous power or thrust, the five-hour run must include 30 minutes at rated takeoff power or thrust.

(b) The test runs required by paragraph (a) of this section may be made with the engine appropriately mounted and using current types of power and thrust measuring equipment.

§ 21.129 Tests: propellers.

Each person manufacturing propellers under a type certificate only shall give each variable pitch propeller an acceptable functional test to determine if it operates properly throughout the normal range of operation.

§ 21.130 Statement of conformity.

Each holder or licensee of a type certificate only, for a product manufactured in the United States, shall, upon the initial transfer by him of the ownership of such product manufactured under that type certificate, or upon application for the original issue of an aircraft airworthiness certificate or an aircraft engine or propeller airworthiness approval tag (FAA Form 8130-3), give the Administrator a statement of conformity (FAA Form 317). This statement must be signed by an authorized person who holds a responsible position in the manufacturing organization, and must include—

(a) For each product, a statement that the product conforms to its type certificate and is in condition for safe operation;

(b) For each aircraft, a statement that the aircraft has been flight checked; and

(c) For each aircraft engine or variable pitch propeller, a statement that the engine or propeller has been subjected by the manufacturer to a final operational check.

However, in the case of a product manufactured for an Armed Force of the United States, a statement of conformity is not required if the product has been accepted by that Armed Forces.

Subpart G—Production Certificates

§ 21.131 Applicability.

This subpart prescribes procedural requirements for the issue of production certificates and rules governing the holders of those certificates.

§ 21.133 Eligibility.

(a) Any person may apply for a production certificate if he holds, for the product concerned, a—

(1) Current type certificate;

(2) Right to the benefits of that type certificate under a licensing agreement; or

(3) Supplemental type certificate.

(b) Each application for a production certificate must be made in a form and manner prescribed by the Administrator.

§ 21.135 Requirements for issuance.

An applicant is entitled to a production certificate if the Administrator finds, after examination of the supporting data and after inspection of the organization and production facilities, that the applicant has complied with §§ 21.139 and 21.143.

§ 21.137 Location of manufacturing facilities.

The Administrator does not issue a production certificate if the manufacturing facilities concerned are located outside the United States, unless the Administrator finds no undue burden on the United States in administering the applicable requirements of the Federal Aviation Act of 1958 or of the Federal Aviation Regulations.

§ 21.139 Quality control.

The applicant must show that he has established and can maintain a quality control system for any product, for which he requests a production certificate, so that each article will meet the design provisions of the pertinent type certificate.

§ 21.143 Quality control data requirements; prime manufacturer.

(a) Each applicant must submit, for approval, data describing the inspection and test procedures necessary to ensure that each article produced conforms to the type design and is in a condition for safe operation, including as applicable—

(1) A statement describing assigned responsibilities and delegated authority of the quality control organization, together with a chart indicating the functional relationship of the quality control organization to management and to other organizational components, and indicating the chain of authority and responsibility within the quality control organization;

(2) A description of inspection procedures for raw materials, purchased items, and parts and assemblies produced by [manufacturer's suppliers], including methods used to ensure acceptable quality of parts and assemblies that cannot be completely inspected for conformity and quality when delivered to the prime manufacturer's plant;

(3) A description of the methods used for production inspection of individual parts and complete assemblies, including the identification of any special manufacturing processes involved, the means used to control the processes, the final test procedure for the complete product, and, in the case of aircraft, a copy of the manufacturer's production flight test procedures and checkoff list;

(4) An outline of the materials review system, including the procedure for recording review board decisions and disposing of rejected parts;

(5) An outline of a system for informing company inspectors of current changes in engineering drawings, specifications, and quality control procedures; and

(6) A list or chart showing the location and type of inspection stations.

(b) Each prime manufacturer shall make available to the Administrator information regarding all delegation of authority to [suppliers] to make major inspections of parts or assemblies for which the prime manufacturer is responsible.

§ 21.147 Changes in quality control system.

After the issue of a production certificate, each change to the quality control system is subject to review by the Administrator. The holder of a production certificate shall immediately notify the Administrator, in writing, of any change that may affect the inspection, conformity, or airworthiness of the product.

§ 21.149 Multiple products.

The Administrator may authorize more than one type certificated product to be manufactured under the terms of one production certificate, if the products have similar production characteristics.

§ 21.151 Production limitation record.

A production limitation record is issued as part of a production certificate. The record lists the type certificate of every product that the applicant is authorized to manufacture under the terms of the production certificate.

§ 21.153 Amendment of the production certificates.

The holder of a production certificate desiring to amend it to add a type certificate or model, or both, must apply therefor in a form and manner prescribed by the Administrator. The applicant must comply with the applicable requirements of §§ 21.139, 21.143, and 21.147.

§ 21.155 Transferability.

A production certificate is not transferable.

§ 21.157 Inspections and tests.

Each holder of a production certificate shall allow the Administrator to make any inspections and tests necessary to determine compliance with the applicable regulations in this subchapter.

§ 21.159 Duration.

A production certificate is effective until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator, or the location of the manufacturing facility is changed.

§ 21.161 Display.

The holder of a production certificate shall display it prominently in the main office of the factory in which the product concerned is manufactured.

§ 21.163 Privileges.

The holder of a production certificate may—

(a) Obtain an aircraft airworthiness certificate without further showing, except that the Administrator may inspect the aircraft for conformity with the type design; or

(b) In the case of other products, obtain approval for installation on certificated aircraft.

§ 21.165 Responsibility of holder.

The holder of a production certificate shall—

(a) Maintain the quality control system in conformity with the data and procedures approved for the production certificate; and

(b) [Determine that each part and each completed product submitted for airworthiness certification or approval conforms to the approved design and is in a condition for safe operation.]

Subpart H—Airworthiness Certificates

§ 21.171 Applicability.

This subpart prescribes procedural requirements for the issue of airworthiness certificates.

§ 21.173 Eligibility.

Any registered owner of a U.S.-registered aircraft (or the agent of the owner) may apply for an airworthiness certificate for that aircraft. An application for an airworthiness certificate must be made in a form and manner acceptable to the Administrator, and may be submitted to any FAA office.

§ 21.175 Airworthiness certificates: classification.

(a) Standard airworthiness certificates are airworthiness certificates issued for aircraft type certificated in the normal, utility, acrobatic, commuter, or transport category, and for manned free balloons, and for aircraft designated by the Administrator as special classes of aircraft.

(b) Special airworthiness certificates are restricted, limited, and provisional airworthiness certificates, special flight permits and experimental certificates.

§ 21.177 Amendment or modification.

An airworthines certificate may be amended or modified only upon application to the Administrator.

§ 21.179 Transferability.

An airworthiness certificate is transferred with the aircraft.

§ 21.181 Duration.

(a) Unless sooner surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator, airworthiness certificates are effective as follows:

(1) Standard airworthiness certificates and airworthiness certificates issued for restricted or limited category aircraft are effective as long as the maintenance, preventive maintenance, and alterations are performed in accordance with Parts 43 and 91 of this chapter and the aircraft are registered in the United States.

(2) A special flight permit is effective for the period of time specified in the permit.

(3) An experimental certificate for research and development, showing compliance with regulations, crew training, or market surveys is effective for one year after the date of issue or renewal unless a shorter period is prescribed by the Administrator. The duration of amateur-built, exhibition, and air-racing experimental certificates will be unlimited unless the Administrator finds for good cause that a specific period should be established.

(b) The owner, operator, or bailee of the aircraft shall, upon request, make it available for inspection by the Administrator.

(c) Upon suspension, revocation, or termination by order of the Administrator of an airworthiness certificate, the owner, operator, or bailee of an aircraft shall, upon request, surrender the certificate to the Administrator.

§ 21.182 Aircraft identification.

(a) Except as provided in paragraph (b) of this section, each applicant for an airworthiness certificate under this subpart must show that his aircraft is identified as prescribed in § 45.11.

(b) Paragraph (a) of this section does not apply to applicants for the following:

(1) A special flight permit.

(2) An experimental certificate for an aircraft that is not amateur built.

(3) A change from one airworthiness classification to another, for an aircraft already identified as prescribed in § 45.11.

[§21.183 Issue of standard airworthiness certificates for normal, utility, acrobatic, commuter, and transport category aircraft; manned free balloons; and special classes of aircraft.]

(a) *New aircraft manufactured under a production certificate.* An applicant for a standard airworthiness certificate for a new aircraft manufactured under a production certificate is entitled to a standard airworthiness certificate without further showing, except that the Administrator may inspect the aircraft to determine conformity to the type design and condition for safe operation.

(b) *New aircraft manufactured under type certificate only.* An applicant for a standard airworthiness certificate for a new aircraft manufactured under a type certificate only is entitled to a standard airworthiness certificate upon presentation, by the holder or licensee of the type certificate, of the statement of conformity prescribed in § 21.130 if the Administrator finds after inspection that the aircraft conforms to the type design and is in condition for safe operation.

(c) *Import aircraft.* An applicant for a standard airworthiness certificate for an import aircraft type certificated in accordance with § 21.29 of this Part is entitled to an airworthiness certificate if the country in which the aircraft was manufactured certifies, and the Administrator finds, that the aircraft conforms to the type design and is in condition for safe operation.

(d) *Other aircraft.* An application for a standard airworthiness certificate for aircraft not covered by paragraphs (a) through (c) of this section is entitled to a standard airworthiness certificate if—

(1) He presents evidence to the Administrator that the aircraft conforms to a type design approved under a type certificate or a supplemental type certificate and to applicable Airworthiness Directives;

(2) The aircraft (except an experimentally certificated aircraft that previously had been issued a different airworthiness certificate under this section) has been inspected in accordance with the performance rules for 100-hour inspections set forth in § 43.15 of this chapter and found airworthy by—

(i) The manufacturer;

(ii) The holder of a repair station certificate as provided in Part 145 of this chapter;

(iii) The holder of a mechanic certificate as authorized in Part 65 of this chapter; or

(iv) The holder of a certificate issued under Part 121 or 127 of this chapter, and having a maintenance and inspection organization appropriate to the aircraft type; and

(3) The Administrator finds after inspection, that the aircraft conforms to the type design, and is in condition for safe operation.

(e) *Noise requirements.* Notwithstanding all other provisions of this section, the following must be complied with for the original issuance of a standard airworthiness certificate:

(1) For transport category large airplanes and turbojet powered airplanes that have not had any flight time before the dates specified in § 36.1(d), no standard airworthiness certificate is originally issued under this section unless the Administrator finds that the type design complies with the noise requirements in § 36.1(d) in addition to the applicable airworthiness requirements in this section. For import airplanes, compliance with this paragraph is shown if the country in which the airplane was manufactured certifies, and the Administrator finds, that § 36.1(d) (or the applicable airplane noise requirements of the country in which the airplane was manufactured and any other requirements the Administrator may prescribe to provide noise levels no greater than those provided by compliance

with § 36.1(d)) and paragraph (c) of this section are complied with.

(2) For normal, utility, acrobatic, [commuter,] or transport category propeller driven small airplanes (except for those airplanes that are designed for "agricultural aircraft operations" (as defined in § 137.3 of this chapter, as effective on January 1, 1966) or for dispensing fire fighting materials to which § 36.1583 of this chapter does not apply) that have not had any flight time before the applicable date specified in Part 36 of this chapter, no standard airworthiness certificate is originally issued under this section unless the applicant shows that the design complies with the applicable noise requirements of Part 36 of this chapter in addition to the applicable airworthiness requirements in this section. For import airplanes, compliance with this paragraph is shown if the country in which the airplane was manufactured certifies, and the Administrator finds, that the applicable requirements of Part 36 of this chapter (or the applicable airplane noise requirements of the country in which the airplane was manufactured and any other requirements the Administrator may prescribe to provide noise levels no greater than those provided by compliance with the applicable requirements of Part 36 of this chapter) and paragraph (c) of this section are complied with.

§ 21.185 Issue of airworthiness certificates for restricted category aircraft.

(a) *Aircraft manufactured under a production certificate or type certificate only.* An applicant for the original issue of a restricted category airworthiness certificate for an aircraft type certificated in the restricted category, that was not previously type certificated in any other category, must comply with the appropriate provisions of § 21.183.

(b) *Other aircraft.* An applicant for a restricted category airworthiness certificate for an aircraft type certificated in the restricted category, that was either a surplus aircraft of the Armed Forces or previously type certificated in another category, is entitled to an airworthiness certificate if the aircraft has been inspected by the Administrator and found by him to be in a good state of preservation and repair and in a condition for safe operation.

(c) *Import aircraft.* An applicant for the original issue of a restricted category airworthiness certificate for an import aircraft type certificated in the restricted category only in accordance with § 21.29 of this Part is entitled to an airworthiness certificate if the country in which the aircraft was manufactured certifies, and the Administrator finds, that the aircraft conforms to the type design and is in a condition for safe operation.

(d) *Noise requirements.* For propeller-driven small airplanes (except airplanes designed for "agricultural aircraft operations,"

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as defined in § 137.3 of this chapter, as effective on January 1, 1966, or for dispensing fire fighting materials) that have not had any flight time before the applicable date specified in Part 36 of this chapter, and notwithstanding the other probisions of this section, no original restricted category airworthiness certificate is issued under this section unless the Administrator finds that the type design complies with the applicable noise requirements of Part 36 of this chapter in addition to the applicable airworthiness requirements of this section. For import airplanes, compliance with this paragraph is shown if the country in which the airplane was manufactured certifies, and the Administrator finds, that the applicable requirements of Part 36 of this chapter (or the applicable airplane noise requirements of the country in which the airplane was manufactured and any other requirements the Administrator may prescribe to provide noise levels no greater than those provided by compliance with the applicable requirements of Part 36 of this chapter) and paragraph (c) of this section are complied with.

§ 21.187 Issue of multiple airworthiness certification.

(a) An applicant for an airworthiness certificate in the restricted category, and in one or more other categories, is entitled to the certificate if—

(1) He shows compliance with the requirements for each category, when the aircraft is in the configuration for that category; and

(2) He shows that the aircraft can be converted from one category to another by removing or adding equipment by simple mechanical means.

(b) The operator of an aircraft certificated under this section shall have the aircraft inspected by the Administrator, or by a certificated mechanic with an appropriate airframe rating, to determine airworthiness each time the aircraft is converted from the restricted category to another category for the carriage of passengers for compensation or hire, unless the Administrator finds this unnecessary for safety in a particular case.

§ 21.189 Issue of airworthiness certificate for limited category aircraft.

(a) An applicant for an airworthiness certificate for an aircraft in the limited category is entitled to the certificate when—

(1) He shows that the aircraft has been previously issued a limited category type certificate and that the aircraft conforms to that type certificate; and

(2) The Administrator finds, after inspection (including a flight check by the applicant), that the aircraft is in a good state of preservation and repair and is in a condition for safe operation.

(b) The Administrator prescribes limitations and conditions necessary for safe operation.

§ 21.191 Experimental certificates.

Experimental certificates are issued for the following purposes:

(a) *Research and development.* Testing new aircraft design concepts, new aircraft equipment, new aircraft installations, new aircraft operating techniques, or new uses for aircraft.

(b) *Showing compliance with regulations.* Conducting flight tests and other operations to show compliance with the airworthiness regulations including flights to show compliance for issuance of type and supplemental type certificates, flights to substantiate major design changes, and flights to show compliance with the function and reliability requirements of the regulations.

(c) *Crew training.* Training of the applicant's flight crews.

(d) *Exhibition.* Exhibiting the aircraft's flight capabilities, performance, or unusual characteristics at air shows, motion picture, television, and similar productions, and the maintenance of exhibition flight proficiency, including (for persons exhibiting aircraft) flying to and from such air shows and productions.

(e) *Air racing.* Participating in air races, including (for such participants) practicing for such air races and flying to and from racing events.

(f) *Market surveys.* Use of aircraft for purposes of conducting market surveys, sales demonstrations, and customer crew training only as provided in § 21.195.

(g) *Operating amateur-built aircraft.* Operating an aircraft the major portion of which has been fabricated and assembled by persons who undertook the construction project solely for their own education or recreation.

§ 21.193 Experimental certificates: general.

An applicant for an experimental certificate must submit the following information:

(a) A statement, in a form and manner prescribed by the Administrator setting forth the purpose for which the aircraft is to be used.

(b) Enough data (such as photographs) to identify the aircraft.

(c) Upon inspection of the aircraft, any pertinent information found necessary by the Administrator to safeguard the general public.

(d) In the case of an aircraft to be used for experimental purposes—

(1) The purpose of the experiment;

(2) The estimated time or number of flights required for the experiment;

(3) The areas over which the experiment will be conducted; and

(4) Except for aircraft converted from a previously certificated type without appreciable change in the external configuration, three-view drawings or three-view dimensioned photographs of the aircraft.

§ 21.195 Experimental certificates: aircraft to be used for market surveys, sales demonstrations and customer crew training.

(a) A manufacturer of aircraft manufactured within the United States may apply for an experimental certificate for an aircraft that is to be used for market surveys, sales demonstrations or customer crew training.

(b) A manufacturer of aircraft engines who has altered a type certificated aircraft by installing different engines, manufactured by him within the United States, may apply for an experimental certificate for that aircraft to be used for market surveys, sales demonstrations, or customer crew training, if the basic aircraft, before alteration, was type certificated in the normal, acrobatic, **[**commuter,**]** or transport category.

(c) A person who has altered the design of a type certificated aircraft may apply for an experimental certificate for the altered aircraft to be used for market surveys, sales demonstrations, or customer crew training if the basic aircraft, before alteration, was type certificated in the normal, utility, acrobatic, or transport category.

(d) An applicant for an experimental certificate under this section is entitled to that certificate if, in addition to meeting the requirements of § 21.193—

(1) He has established an inspection and maintenance program for the continued airworthiness of the aircraft; and

(2) He shows that the aircraft has been flown for at least 50 hours, or for at least 5 hours if it is a type certificated aircraft which has been modified.

§ 21.197 Special flight permits.

(a) A special flight permit may be issued for an aircraft that may not currently meet applicable airworthiness requirements but is capable of safe flight, for the following purposes—

(1) Flying the aircraft to a base where repairs, alterations, or maintenance are to be performed, or to a point of storage.

(2) Delivering or exporting the aircraft.

(3) Production flight testing new production aircraft.

(4) Evacuating aircraft from areas of impending danger.

(5) Conducting customer demonstration flights in new production aircraft that have satisfactorily completed production flight tests.

(b) A special flight permit may also be issued to authorize the operation of an aircraft at a weight in excess of its maximum certificated takeoff weight for flight beyond the normal range over water, or over land areas where adequate landing facilities or appropriate fuel is not available. The excess weight that may be authorized under this paragraph is limited to the additional fuel, fuel-carrying facilities, and navigation equipment necessary for the flight.

(c) Upon application, as prescribed in § 121.79, § 127.27, and § 135.17 of this chapter, a special flight permit with a continuing authorization may be issued for aircraft that may not meet applicable airworthiness requirements but are capable of safe flight, for the purpose of flying aircraft to a base where maintenance or alterations are to be performed. The permit issued under this paragraph is an authorization, including conditions and limitations for flight, which is set forth in the certificate holder's operations specifications. The permit issued under this paragraph may be issued to—

(1) Certificate holders authorized to conduct operations under Part 121 or Part 127 of this chapter; or

(2) Certificate holders authorized to conduct operations under Part 135 for those aircraft they operate and maintain under a continuous airworthiness maintenance program prescribed by § 135.411(a) (2) or (b) of that Part.

The permit issued under this paragraph is an authorization, including any conditions and limitations for flight, which is set forth in the certificate holder's operations specifications.

§ 21.199 Issue of special flight permits.

(a) Except as provided in § 21.197(c), an applicant for a special flight permit must submit a statement in a form and manner prescribed by the Administrator, indicating—

(1) The purpose of the flight.

(2) The proposed itinerary.

(3) The crew required to operate the aircraft and its equipment, e.g., pilot, co-pilot, navigator, etc.

(4) The ways, if any, in which the aircraft does not comply with the applicable airworthiness requirements.

(5) Any restriction the applicant considers necessary for safe operation of the aircraft.

(6) Any other information considered necessary by the Administrator for the purpose of prescribing operating limitations.

(b) The Administrator may make, or require the applicant to make appropriate inspections or tests necessary for safety.

Subpart I—Provisional Airworthiness Certificates

§ 21.211 Applicability.

This subpart prescribes procedural requirements for the issue of provisional airworthiness certificates.

§ 21.213 Eligibility.

(a) A manufacturer who is a United States citizen may apply for a Class I or Class II provisional airworthiness certificates for aircraft manufactured by him within the U.S.

(b) Any holder of an air carrier operating certificate under Part 121 or Part 127 of this chapter who is a United States citizen may apply for a Class II provisional airworthiness certificate for transport category aircraft that meet either of the following:

(1) The aircraft has a current Class II provisional type certificate or an amendment thereto.

(2) The aircraft has a current provisional amendment to a type certificate that was preceded by a corresponding Class II provisional type certificate.

(c) An aircraft engine manufacturer who is a United States citizen and who has altered a type certificated aircraft by installing different type certificated engines, manufactured by him within the United States, may apply for a Class I provisional airworthiness certificate for that aircraft, if the basic aircraft, before alteration, was type certificated in the normal, utility, acrobatic, [commuter,] or transport category.

§ 21.215 Application.

Applications for provisional airworthiness certificates must be submitted to the Chief, Engineering and Manufacturing Branch, Flight Standards Division, of the region in which FAA Regional Office for the area in which the manufacturer or air carrier is located (or, in the case of the Western Region, the Chief, Aircraft Engineering Division). The application must be accompanied by the pertinent information specified in this subpart.

§ 21.217 Duration.

Unless sooner surrendered, superseded, revoked, or otherwise terminated, provisional airworthiness certificates are effective for the duration of the corresponding provisional type certificate, amendment to a provisional type certificate, or provisional amendment to the type certificate.

§ 21.219 Transferability.

Class I provisional airworthiness certificates are not transferable. Class II provisional airworthiness certificates may be transferred to an air carrier eligible to apply for a certificate under § 21.213(b).

§ 21.221 Class I provisional airworthiness certificates.

(a) Except as provided in § 21.225, an applicant is entitled to a Class I provisional airworthiness certificate for an aircraft for which a Class I provisional type certificate has been issued if—

(1) He meets the eligibility requirements of § 21.213 and he complies with this section; and

(2) The Administrator finds that there is no feature, characteristic, or condition of the aircraft that would make the aircraft unsafe when operated in accordance with the limitations established in §§ 21.81(e) and 91.41 of this subchapter.

(b) The manufacturer must hold a provisional type certificate for the aircraft.

(c) The manufacturer must submit a statement that the aircraft conforms to the type design corresponding to the provisional type certificate and has been found by him to be in safe operating condition under all applicable limitations.

(d) The aircraft must be flown at least five hours by the manufacturer.

(e) The aircraft must be supplied with a provisional aircraft flight manual or other document and appropriate placards containing the limitations established by §§ 21.81(e) and 91.41.

§ 21.223 Class II provisional airworthiness certificates.

(a) Except as provided in § 21.225, an applicant is entitled to a Class II provisional airworthiness certificate for an aircraft for which a Class II provisional type certificate has been issued if—

(1) He meets the eligibility requirements of § 21.213 and he complies with this section; and

(2) The Administrator finds that there is no feature, characteristic, or condition of the aircraft that would make the aircraft unsafe when operated in accordance with the limitations established in §§ 21.83(h), 91.41, and 121.207 of this chapter.

(b) The applicant must show that a Class II provisional type certificate for the aircraft has been issued to the manufacturer.

(c) The applicant must submit a statement by the manufacturer that the aircraft has been manufactured under a quality control system adequate to ensure that the aircraft conforms to the type design corresponding with the provisional type certificate.

(d) The applicant must submit a statement that the aircraft has been found by him to be in a safe operating condition under the applicable limitations.

(e) The aircraft must be flown at least five hours by the manufacturer.

(f) The aircraft must be supplied with a provisional aircraft flight manual containing the limitations established by §§ 21.83(h), 91.41, and 121.207 of this chapter.

§ 21.225 Provisional airworthiness certificates corresponding with provisional amendments to type certificates.

(a) An applicant is entitled to a Class I or a Class II provisional airworthiness certificate, for an aircraft, for which a provisional amendment to the type certificate has been issued, if—

(1) He meets the eligibility requirements of § 21.213 and he complies with this section; and

(2) The Administrator finds that there is no feature, characteristic, or condition of the aircraft, as modified in accordance with the provisionally amended type certificate, that would make the aircraft unsafe when operated in accordance with the applicable limitations established in §§ 21.85(g), 91.41, and 121.207 of this chapter.

(b) The applicant must show that the modification was made under a quality control system adequate to ensure that the modification conforms to the provisionally amended type certificate.

(c) The applicant must submit a statement that the aircraft has been found by him to be in a safe operating condition under the applicable limitations.

(d) The aircraft must be flown at least five hours by the manufacturer.

(e) The aircraft must be supplied with a provisional aircraft flight manual or other document and appropriate placards containing the limitations required by §§ 21.85(g), 91.41, and 121.207 of this chapter.

Subpart J—Delegation Option Authorization Procedures

§ 21.231 Applicability.

This subpart prescribes procedures for—

(a) Obtaining and using a delegation option authorization for type, production, and airworthiness certification (as applicable) of—

(1) Small airplanes and small gliders;

[(2) Commuter category airplanes;]

(3) Normal category rotorcraft;

(4) Turbojet engines of not more than 1,000 pounds thrust;

(5) Turbopropeller and reciprocating engines of not more than 500 brake horsepower; and

(6) Propellers manufactured for use on engines covered by subparagraph (4) of this paragraph; and

(b) Issuing airworthiness approval tags for engines, propellers, and parts of products covered by paragraph (a) of this section.

§ 21.235 Application.

(a) An application for a delegation option authorization must be submitted, in a form and manner prescribed by the Administrator, to the FAA Regional Office for the area in which the manufacturer is located.

(b) The application must include the names, signatures, and titles of the persons for whom authorization to sign airworthiness certificates, repair and alteration forms, and inspection forms is requested.

§ 21.239 Eligibility.

To be eligible for a delegation option authorization, the applicant must—

(a) Hold a current type certificate, issued to him under the standard procedures, for a product type certificated under the same part as each product for which the delegation option authorization is sought;

(b) Hold a current production certificate issued under the standard procedures;

(c) Employ a staff of engineering, flight test, production, and inspection personnel who can determine compliance with the applicable airworthiness requirements of this chapter; and

(d) Meet the requirements of this subpart.

§ 21.243 Duration.

A delegation option authorization is effective until it is surrendered or the Administrator suspends, revokes, or otherwise terminates it.

§ 21.245 Maintenance of eligibility.

The holder of a delegation option authorization shall continue to meet the requirements for issue of the authorization or shall notify the Administrator within 48 hours of any change (including a change of personnel) that could affect the ability of the holder to meet those requirements.

§ 21.247 Transferability.

A delegation option authorization is not transferable.

§ 21.249 Inspections.

Upon request, each holder of a delegation option authorization and each applicant shall let the Administrator inspect his organization, facilities, product, and records.

§ 21.251 Limits of applicability.

(a) Delegation option authorizations apply only to products that are manufactured by the holder of the authorization.

(b) Delegation option authorizations may be used for—

(1) Type certification;

(2) Changes in the type design of products for which the manufacturer holds, or obtains, a type certificate;

(3) The amendment of a production certificate held by the manufacturer is to include additional models or additional types for which he holds or obtains a type certificate; and

(4) The issue of—

(i) Experimental certificate for aircraft for which the manufacturer has applied for a type certificate or amended type certificate under § 21.253, to permit the operation of those aircraft for the purpose of research and development, crew training, market surveys, or the showing of compliance with the applicable airworthiness requirements;

(ii) Airworthiness certificates (other than experimental certificates) for aircraft for which the manufacturer holds a type certificate and holds or is in the process of obtaining a production certificate;

(iii) Airworthiness approval tags [(FAA Form 8130-3)][1] for engines and propellers for which the manufacturer holds a type certificate and holds or is in the process of obtaining a production certificate; and

(iv) Airworthiness approval tags [(FAA Form 8130-3)][1] for parts of products covered by this section.

(c) Delegation option procedures may be applied to one or more types selected by the manufacturer, who must notify the FAA of each model, and of the first serial number of each model manufactured by him under the delegation option procedures. Other types or models may remain under the standard procedures.

(d) Delegation option authorizations are subject to any additional limitations prescribed by the Administrator after inspection of the applicant's facilities or review of the staff qualifications.

§ 21.253 Type certificates: application.

(a) To obtain, under the delegation option authorization, a type certificate for a new product or an amended type certificate the manufacturer must submit to the Administrator—

(1) An application for a type certificate (FAA Form 312);

(2) A statement listing the airworthiness requirements of this chapter (by part number and effective date) that the manufacturer considers applicable;

(3) After determining that the type design meets the applicable requirements, a statement certifying that this determination has been made;

(4) After placing the required technical data and type inspection report in the technical data file required by § 21.293(a)(1)(i), a statement certifying that this has been done;

(5) A proposed type certificate data sheet; and

(6) An Aircraft Flight Manual (if required) or a summary of required operating limitations and other information necessary for safe operation of the product.

[§ 21.257 Type certificates: issue.

[An applicant is entitled to a type certificate for a product manufactured under a delegation option authorization if the Administrator finds that the product meets the applicable airworthiness and noise requirements (including applicable acoustical change requirements in the case of changes in type design).][2]

§ 21.261 Equivalent safety provisions.

The manufacturer shall obtain the Administrator's concurrence on the application of all equivalent safety provisions applied under § 21.21.

§ 21.267 Production certificates.

To have a new model or new type certificate listed on his production certificate (issued under Subpart G of this part), the manufacturer must submit to the Administrator—

(a) An application for an amendment to the production certificate;

(b) After determining that the production certification requirements of Subpart G, with respect to the new model or type, are met, a statement certifying that this determination has been made;

(c) A statement identifying the type certificate number under which the product is being manufactured; and

(d) After placing the manufacturing and quality control data required by § 21.143 with the data required by § 21.293(a)(1)(ii), a statement certifying that this has been done.

§ 21.269 Export airworthiness approvals.

The manufacturer may issue export airworthiness approvals.

Ch. 3 ([1]Amdt. 21-43, Eff. 2/14/75; [2]Amdt. 21-42, Eff. 2/7/75)

§ 21.271 Airworthiness approval tags.

(a) A manufacturer may issue an airworthiness approval tag [(FAA Form 8130-3)] for each engine and propeller covered by § 21.251-(b)(4), and may issue an airworthiness approval tag for parts of each product covered by that section, if he finds, on the basis of inspection and operation tests, that those products conform to a type design for which he holds a type certificate and are in condition for safe operation.

(b) When a new model has been included on the Production Limitation Record, the production certificate number shall be stamped on the engine or propeller identification data plate instead of issuing an airworthiness approval tag.

§ 21.273 Airworthiness certificates other than experimental.

(a) The manufacturer may issue an airworthiness certificate for aircraft manufactured under a delegation option authorization if he finds, on the basis of the inspection and production flight check, that each aircraft conforms to a type design for which he holds a type certificate and is in a condition for safe operation.

(b) The manufacturer may authorize any employee to sign airworthiness certificates if that employee—

(1) Performs, or is in direct charge of, the inspection specified in paragraph (a) of this section; and

(2) Is listed on the manufacturer's application for the delegation option authorization, or on amendments thereof.

§ 21.275 Experimental certificates.

(a) The manufacturer shall, before issuing an experimental certificate, obtain from the Administrator any limitations and conditions that the Administrator considers necessary for safety.

(b) For experimental certificates issued by the manufacturer, under this subpart, for aircraft for which the manufacturer holds the type certificate and which have undergone changes to the type design requiring flight test, the manufacturer may prescribe any operating limitations that he considers necessary.

§ 21.277 Data review and service experience.

(a) If the Administrator finds that a product for which a type certificate was issued under this subpart does not meet the applicable airworthiness requirements, or that an unsafe feature or characteristic caused by a defect in design or manufacture exists, the manufacturer, upon notification by the Administrator, shall investigate the matter and report to the Administrator the results of the investigation and the action, if any, taken or proposed.

(b) If corrective action by the user of the product is necessary for safety because of any noncompliance or defect specified in paragraph (a) of this section, the manufacturer shall submit the information necessary for the issue of an Airworthiness Directive under Part 39.

§ 21.289 Major repairs, rebuilding, and alteration.

For types covered by a delegation option authorization, a manufacturer may—

(a) After finding that a major repair or major alteration meets the applicable airworthiness requirements of this chapter, approve that repair or alteration; and

(b) Authorize any employee to execute and sign FAA Form 337 and make required log book entries if that employee—

(1) Inspects, or is in direct charge of inspecting, the repair, rebuilding, or alteration; and

(2) Is listed on the application for the delegation option authorization, or on amendments thereof.

§ 21.293 Current records.

(a) The manufacturer shall maintain at his factory, for each product type certificated under a delegation option authorization, current records containing the following:

(1) For the duration of the manufacturing operation under the delegation option authorization—

(i) A technical data file that includes the type design drawings, specifications, reports on tests prescribed by this part, and the original type inspection report and amendments to that report;

(ii) The data (including amendments) required to be submitted with the original application for each production certificate; and

(iii) A record of any rebuilding and alteration performed by the manufacturer on products manufactured under the delegation option authorization.

(2) For 2 years—

(i) A complete inspection record for each product manufactured, by serial number, and data covering the processes and tests to which materials and parts are subjected; and

(ii) A record of reported service difficulties.

(b) The records and data specified in paragraph (a) of this section shall be—

(1) Made available, upon the Administrator's request, for examination by the Administrator at any time; and

(2) Identified and sent to the Administrator as soon as the manufacturer no longer operates under the delegation option procedures.

Subpart K—Approval of Materials, Parts, Processes, and Appliances

§ 21.301 Applicability.

This subpart prescribes procedural requirements for the approval of certain materials, parts, processes, and appliances.

§ 21.303 Replacement and modification parts.

[(a) Except as provided in paragraph (b) of this section, no person may produce a modification or replacement part for sale for installation on a type certificated product unless it is produced pursuant to a Parts Manufacturer Approval issued under this subpart.]

(b) This section does not apply to the following:

(1) Parts produced under a type or production certificate.

(2) Parts produced by an owner or operator for maintaining or altering his own product.

(3) Parts produced under an FAA Technical Standard Order.

(4) Standard parts (such as bolts and nuts) conforming to established industry or United States specifications.

(c) An application for a Parts Manufacturer Approval is made to the Regional Office of the region in which the manufacturing facility is located and must include the following:

(1) The identity of the product on which the part is to be installed.

(2) The name and address of the manufacturing facilities at which these parts are to be manufactured.

(3) The design of the part, which consists of—

(i) Drawings and specifications necessary to show the configuration of the part; and

(ii) Information on dimensions, materials, and processes necessary to define the structural strength of the part.

(4) Test reports and computations necessary to show that the design of the part meets the airworthiness requirements of the Federal Aviation Regulations applicable to the product on which the part is to be installed, unless the applicant shows that the design of the part is identical to the design of a part that is covered under a type certificate. If the design of the part was obtained by a licensing agreement, evidence of that agreement must be furnished.

(d) An applicant is entitled to a Parts Manufacturer Approval for a replacement or modification part if—

(1) The Administrator finds, upon examination of the design and after completing all tests and inspections, that the design meets the airworthiness requirements of the Federal Aviation Regulations applicable to the product on which the part is to be installed; and

(2) He submits a statement certifying that he has established the fabrication inspection system required by paragraph (h) of this section.

(e) Each applicant for a Parts Manufacturer Approval must allow the Administrator to make any inspection or test necessary to determine compliance with the applicable Federal Aviation Regulations. However, unless otherwise authorized by the Administrator—

(1) No part may be presented to the Administrator for an inspection or test unless compliance with paragraphs (f)(2) through (f)(4) of this section has been shown for that part; and

(2) No change may be made to a part between the time that compliance with paragraphs (f)(2) through (f)(4) of this section is shown for that part and the time that the part is presented to the Administrator for the inspection or test.

(f) Each applicant for a Parts Manufacturer Approval must make all inspections and tests necessary to determine—

(1) Compliance with the applicable airworthiness requirements;

(2) That materials conform to the specifications in the design;

(3) That the part conforms to the drawings in the design; and

(4) That the fabrication processes, construction, and assembly conform to those specified in the design.

(g) The Administrator does not issue a Parts Manufacturer Approval if the manufacturing facilities for the part are located outside of the United States, unless the Administrator finds that the location of the manufacturing facilities places no burden on the FAA in administering applicable airworthiness requirements.

[(h) Each holder of a Parts Manufacturer Approval shall establish and maintain a fabrication inspection system that ensures that each completed part conforms to its design data and is safe for installation on applicable type certificated products. The system shall include the following:]

(1) Incoming materials used in the finished part must be as specified in the design data.

(2) Incoming materials must be properly identified if their physical and chemical properties cannot otherwise be readily and accurately determined.

(3) Materials subject to damage and deterioration must be suitably stored and adequately protected.

(4) Processes affecting the quality and safety of the finished product must be accomplished in accordance with acceptable specifications.

(5) Parts in process must be inspected for conformity with the design data at points in production where accurate determination can be made. Statistical quality control procedures may be employed where it is shown that a satisfactory level of quality will be maintained for the particular part involved.

(6) Current design drawings must be readily available to manufacturing and inspection personnel, and used when necessary.

(7) Major changes to the basic design must be adequately controlled and approved before being incorporated in the finished part.

(8) Rejected materials and components must be segregated and identified in such a manner as to preclude their use in the finished part.

(9) Inspection records must be maintained, identified with the completed part, where practicable, and retained in the manufacturer's file for a period of at least 2 years after the part has been completed.

(i) A Parts Manufacturer Approval issued under this section is not transferable and is effective until surrendered or withdrawn or otherwise terminated by the Administrator.

[(j) The holder of a Parts Manufacturer Approval shall notify the FAA in writing within 10 days from the date the manufacturing facility at which the parts are manufactured is relocated or expanded to include additional facilities at other locations.]

(k) Each holder of a Parts Manufacturer Approval shall determine that each completed part conforms to the design data and is safe for installation on type certificated products.

§ 21.305 Approval of materials, parts, processes, and appliances.

Whenever a material, part, process, or appliance is required to be approved under this chapter, it may be approved—

(a) Under a Part Manufacturer Approval issued under § 21.303;

[(b) Under a Technical Standard Order issued by the Administrator. Advisory Circular 20-110 contains a list of Technical Standard Orders that may be used to obtain approval. Copies of the Advisory Circular may be obtained from the U.S. Department of Transportation, Publications Section (M-443.1), Washington, D.C. 20590,]

(c) In conjunction with type certification procedures for a product; or

(d) In any other manner approved by the Administrator.

§ 21.307 [Deleted]

Subpart L—Export Airworthiness Approvals

§ 21.321 Applicability.

(a) This subpart prescribes—

(1) Procedural requirements for the issue of export airworthiness approvals; and

(2) Rules governing the holders of those approvals.

(b) For the purposes of this subpart—

(1) A Class I product is a complete aircraft, aircraft engine, or propeller, which—

(i) Has been type certificated in accordance with the applicable Federal Aviation Regulations and for which Federal Aviation Specifications or type certificate data sheets have been issued; or

(ii) Is identical to a type certificated product specified in paragraph (b) (1) (i) of this section in all respects except as is otherwise acceptable to the civil aviation authority of the importing state.

(2) A Class II product is a major component of a Class I product (e.g., wings, fuselages, empennage assemblies, landing gears, power transmissions, control surfaces, etc.), the failure of which would jeopardize the safety of a Class I product; or any part, material, or appliance, approved and manufactured under the Technical Standard Order (TSO) system in the "C" series.

(3) A Class III product is any part or component which is not a Class I or Class II product and includes standard parts, i.e., those designated as AN, NAS, SAE, etc.

(4) The words "newly overhauled" when used to describe a product means that the product has not been operated or placed in service, except for functional testing, since having been overhauled, inspected, and approved for return to service in accordance with the applicable Federal Aviation Regulations.

§ 21.323 Eligibility.

(a) Any exporter or his authorized representative may obtain an export airworthiness approval for a Class I or Class II product.

(b) Any manufacturer may obtain an export airworthiness approval for a Class III product if the manufacturer—

(1) Has in his employ a designated representative of the Administrator who has been authorized to issue that approval; and

(2) Holds for that product—

(i) A production certificate;

(ii) An approved production inspection system;

(iii) An FAA Parts Manufacturer Approval (PMA); or

(iv) A Technical Standard Order authorization.

§ 21.325 Export airworthiness approvals.

(a) *Kinds of approvals.*

(1) Export airworthiness approval of Class I products is issued in the form of Export Certificates of Airworthiness, FAA Form 8130-4. Such certificate does not authorize the operation of aircraft.

(2) Export airworthiness approval of Class II and III products is issued in the form of Airworthiness Approval Tags, FAA Form 8130-3.

(b) *Products which may be approved.* Export airworthiness approvals are issued for—

(1) New aircraft that are assembled and that have been flight tested, and other Class I products located in the United States, except that export airworthiness approval may be issued for any of the following without assembly or flight-test:

[(i) A small airplane type certificated under Part 3 or 4a of the Civil Air Regulations, or Part 23 of the Federal Aviation Regulations, and manufactured under a production certificate;

[(ii) A glider type certificated under § 21.23 of this Part and manufactured under a production certificate; or

[(iii) A normal category rotorcraft type certificated under Part 6 of the Civil Air Regulations or Part 27 of the Federal Aviation Regulations and manufactured under a production certificate.]

(2) Used aircraft possessing a valid U.S. airworthiness certificate, or other used Class I products that have been maintained in accordance with the applicable CARs or FARs and are located in a foreign country, if the Administrator finds that the location places no undue burden upon the FAA in administering the provisions of this regulation.

(3) Class II and III products that are manufactured and located in the U.S.

(c) *Export airworthiness approval exceptions.* If the export airworthiness approval is issued on the basis of a written statement by the importing state as provided for in §21.327 (e) (4), the requirements that are not met and the differences in configuration, if any, between the product to be exported and the related type certificated product, are listed on the export airworthiness approval as exceptions.

§ 21.327 Application.

(a) Except as provided in paragraph (b) of this section, an application for export airworthiness approval for a Class I or Class II product is made on a form and in a manner prescribed by the Administrator and is submitted to the appropriate Flight Standards District Office or to the nearest international field office.

(b) A manufacturer holding a production certificate may apply orally to the appropriate Flight Standards District Office or the nearest international field office for export airworthiness approval of a Class II product approved under his production certificate.

(c) Application for export airworthiness approval of Class III products is made to the designated representative of the Administrator authorized to issue those approvals.

(d) A separate application must be made for—

(1) Each aircraft;

(2) Each engine and propeller, except that one application may be made for more than one engine or propeller, if all are of the same type and model and are exported to the same purchaser and country; and

(3) Each type of Class II product except that one application may be used for more than one type of Class II product when—

(i) They are separated and identified in the application as to the type and model of the related Class I product; and

(ii) They are to be exported to the same purchaser and country.

(e) Each application must be accompanied by a written statement from the importing country that it will validate the export airworthiness approval if the product being exported is—

(1) An aircraft manufactured outside the U.S. and being exported to a country with which the U.S. has a reciprocal agreement concerning the validation of export certificates;

[(2) An unassembled aircraft which has not been flight-tested;

[(3) A product that does not meet the special requirement of the importing country; or

[(4) A product that does not meet a requirement specified in § § 21.329, 21.331, or 21.333, as applicable, for the issuance of an export airworthiness approval. The written statement must list the requirements not met.]

(f) Each application for export airworthiness approval of a Class I product must include, as applicable:

(1) A Statement of Conformity, [FAA Form 8130–9], for each new product that has not been manufactured under a production certificate.

(2) A weight and balance report, with a loading schedule when applicable, for each aircraft in accordance with Part 43 of this chapter. For transport aircraft [and commuter category airplanes,] this report must be based on an actual weighing of the aircraft within the preceding twelve months, but after any major repairs or alterations to the aircraft. Changes in equipment not classed as major changes that are made after the actual weighing may be accounted for on a "computed" basis and the report revised accordingly. Manufacturers of new nontransport category airplanes, normal category rotorcraft, and gliders may submit reports having computed weight and balance data, in place of an actual weighing of the aircraft, if fleet weight control procedures approved by the FAA have been established for such aircraft. In such a case, the following statement must be entered in each report: "The weight and balance data shown in this report are computed on the basis of Federal Aviation Administration approved procedures for establishing fleet weight averages." The weight and balance report must include an equipment list showing weights and moment arms of all required and optional items of equipment that are included in the certificated empty weight.

(3) A maintenance manual for each new product when such a manual is required by the applicable airworthiness rules

(4) Evidence of compliance with the applicable airworthiness directives. A suitable notation must be made when such directives are not complied with.

(5) When temporary installations are incorporated in an aircraft for the purpose of export delivery, the application form must include a general description of the installations together with a statement that the installation will be removed and the aircraft restored to the approved configuration upon completion of the delivery flight.

(6) Historical records such as aircraft and engine log books, repair and alteration forms, etc., for used aircraft and newly overhauled products.

(7) For products intended for overseas shipment, the application form must describe the methods used, if any, for the preservation and packaging of such products to protect them against corrosion and damage while in transit or storage. The description must also indicate the duration of the effectiveness of such methods.

(8) The Airplane or Rotorcraft Flight Manual when such material is required by the applicable airworthiness regulations for the particular aircraft.

(9) A statement as to the date when title passed or is expected to pass to a foreign purchaser.

(10) The data required by the special requirements of the importing country.

§ 21.329 Issue of Export Certificates of Airworthiness for Class I products.

An applicant is entitled to an export certificate of airworthiness for a Class I product if that applicant shows at the time the product is submitted to the Administrator for export airworthiness approval that it meets the requirements of paragraphs (a) through (f) of this section, as applicable, except as provided in paragraph (g) of this section:

(a) New or used aircraft manufactured in the United States must meet the airworthiness requirement for a standard U.S. airworthiness certificate under § 21.183, or meet the airworthiness certification requirements for a "restricted" airworthiness certificate under § 21.185.

(b) New or used aircraft manufactured outside the United States must have a valid U.S. standard airworthiness certificate.

(c) Used aircraft must have undergone an annual type inspection and be approved for return to service in accordance with Part 43 of this Chapter. The inspection must have been performed and properly documented within 30 days before the date the application is made for an export certificate of airworthiness. In complying with this paragraph, consideration may be given to the inspections performed on an aircraft maintained in accordance with a continuous airworthiness maintenance program under Parts 121 or 127 of this Chapter or a progressive inspection program under Part 91 of this Chapter, within the 30 days prior to the date the application is made for an export certificate of airworthiness.

(d) New engines and propellers must conform to the type design and must be in a condition for safe operation.

(e) Used engines and propellers which are not being exported as part of a certificated aircraft must have been newly overhauled.

(f) The special requirements of the importing country must have been met.

[(g) A product need not meet a requirement specified in paragraphs (a) through (f) of this section, as applicable, if acceptable to the importing country and the importing country indicates that acceptability in accordance with § 21.327 (e) (4) of this Part.]

§ 21.331 Issue of airworthiness approval tags for Class II products.

[(a) An applicant is entitled to an export airworthiness approval tag for Class II products if that applicant shows, except as provided in paragraph (b) of this section, that--]

[(1)] The products are new or have been newly overhauled and conform to the approved design data;

[(2)] The products are in a condition for safe operation;

[(3)] The products are identified with at least the manufacturer's name, part number, model designation (when applicable), and serial number or equivalent; and

[(4)] The products meet the special requirements of the importing country.

[(b)] A product need not meet a requirement specified in paragraph (a) of this section if acceptable to the importing country and the importing country indicates that acceptability in accordance with § 21.327 (e) (4) of this Part.]

§ 21.333 Issue of export airworthiness approval tags for Class III products.

[(a) An applicant is entitled to an export airworthiness approval tag for Class III products if that applicant shows, except as provided in paragraph (b) of this section, that—]

[(1)] The products conform to the approved design data applicable to the Class I or Class II products of which they are a part;

[(2)] The products are in a condition for safe operation; and

[(3)] The products comply with the special requirements of the importing country.

[(b) A product need not meet a requirement specified in paragraph (a) of this section if acceptable to the importing country and the importing country indicates that acceptability in accordance with § 21.327 (e) (4) of this Part.]

§ 21.335 Responsibilities of exporters.

Each exporter receiving an export airworthiness approval for a product shall—

(a) Forward to the air authority of the importing country all documents and information necessary for the proper operation of the products being exported, e.g., Flight Manuals, Maintenance Manuals, Service Bulletins, and assembly instructions, and such other material as is stipulated in the special requirements of the importing country. The documents, information, and material may be forwarded by any means consistent with the special requirements of the importing country;

(b) Forward the manufacturer's assembly instructions and an FAA-approved flight test checkoff form to the air authority of the importing country when unassembled aircraft are being exported. These instructions must be in sufficient detail to permit whatever rigging, alignment, and ground testing is necessary to ensure that the aircraft will conform to the approved configuration when assembled;

(c) Remove or cause to be removed any temporary installation incorporated on an aircraft for the purpose of export delivery and restore the aircraft to the approved configuration upon completion of the delivery flight;

(d) Secure all proper foreign entry clearances from all the countries involved when conducting sales demonstrations or delivery flights; and

(e) When title to an aircraft passes or has passed to a foreign purchaser—

(1) Request cancellation of the U.S. registration and airworthiness certificates, giving the date of transfer of title, and the name and address of the foreign owner;

(2) Return the Registration and Airworthiness Certificates, AC Form 8050.3 and FAA Form 8100-2, to the FAA; and

(3) Submit a statement certifying that the United States' identification and registration numbers have been removed from the aircraft in compliance with § 45.33.

§ 21.337 Performance of inspections and overhauls.

Unless otherwise provided for in this subpart, each inspection and overhaul required for export airworthiness approval of Class I and Class II products must be performed and approved by one of the following:

(a) The manufacturer of the product.

(b) An appropriately certificated domestic repair station.

(c) An appropriately certificated foreign repair station having adequate overhaul facilities, and maintenance organization appropriate to the product involved, when the product is a Class I product located in a foreign country and an international office of Flight Standards Service has approved the use of such foreign repair station.

(d) The holder of an inspection authorization as provided in Part 65 of this Chapter.

(e) An air carrier, when the product is one that the carrier has maintained under its own or another air carrier's continuous airworthiness maintenance program and maintenance manuals as provided in Parts 121 or 127 of this Chapter.

(f) A commercial operator, when the product is one that the operator has maintained under its continuous airworthiness maintenance program and maintenance manual as provided in Part 121 of this Chapter.

§ 21.339 Special export airworthiness approval for aircraft.

A special export certificate of airworthiness may be issued for an aircraft located in the United States that is to be flown to several foreign countries for the purpose of sale, without returning the aircraft to the United States for the certificate if—

[(a) The aircraft possesses either—

[(1) A standard U.S. certificate of airworthiness; or

[(2) A special U.S. certificate of airworthiness in the restricted category issued under § 21.185;]

(b) The owner files an application as required by § 21.327 of this subpart, except that items 3 and 4 of the application (FAA Form 8130-1) need not be completed;

(c) The aircraft is inspected by the Administrator before leaving the United States and is found to comply with all the applicable requirements;

(d) A list of foreign countries in which it is intended to conduct sales demonstrations, together with the expected dates and duration of such demonstration, is included in the application;

(e) For each prospective importing country, the applicant shows that—

(1) He has met that country's special requirements, other than those requiring that documents, information, and materials be furnished; and

(2) He has the documents, information, and materials necessary to meet the special requirements of that country; and

(f) All other requirements for the issuance of a Class I export certificate of airworthiness are met.

Subpart M—Designated Alteration Station Authorization Procedures

§ 21.431 Applicability.

(a) This subpart prescribes Designated Alteration Station (DAS) authorization procedures for—

(1) Issuing supplemental type certificates;

(2) Issuing experimental certificates; and

(3) Amending standard airworthiness certificates.

(b) This subpart applies to domestic repair station, air carriers (except air taxi operators), commercial operators of large aircraft, and manufacturers of products.

§ 21.435 Application.

The applicant for a DAS authorization must submit an application, in writing and signed by an official of the applicant, to the FAA Regional Office for the region in which the applicant is located. The application must contain—

(a) The repair station certificate number held by the repair station applicant, and the current ratings covered by the certificate;

(b) The air carrier or commercial operator operating certificate number held by the air carrier or commercial operator applicant, and the products that it may operate and maintain under the certificate;

(c) A statement by the manufacturer applicant of the products for which he holds the type certificate;

(d) The names, signatures, and titles of the persons for whom authorization to issue supplemental type certificates or experimental certificates, or amend airworthiness certificates, is requested; and

(e) A description of the applicant's facilities, and of the staff with which compliance with § 21.439 (a) (4) is to be shown.

§ 21.439 Eligibility.

(a) To be eligible for a DAS authorization, the applicant must—

(1) Hold a current domestic repair station certificate under Part 145, or air carrier or commercial operator operating certificate under Part 121;

(2) Be a manufacturer of a product for which it has alteration authority under § 43.3(i) of this subchapter;

(3) Have adequate maintenance facilities and personnel, in the United States, appropriate to the products that it may operate and maintain under its certificate; and

(4) Employ, or have available, a staff of engineering, flight test, and inspection personnel who can determine compliance with the applicable airworthiness requirements of this chapter.

(b) At least one member of the staff required by paragraph (a) (4) of this section must have all of the following qualifications:

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(1) A thorough working knowledge of the applicable requirements of this chapter.

(2) A position, on the applicant's staff, with authority to establish alteration programs that ensure that altered products meet the applicable requirements of this chapter.

(3) At least one year of satisfactory experience in direct contact with the FAA (or its predecessor agency (CAA)) while processing engineering work for type certification or alteration projects.

(4) At least eight years of aeronautical engineering experience (which may include the one year required by subparagraph (3) of this paragraph).

(5) The general technical knowledge and experience necessary to determine that altered products, of the types for which a DAS authorization is requested, are in condition for safe operation.

§ 21.441 Procedure manual.

(a) No DAS may exercise any authority under this subpart unless it submits, and obtains approval of, a procedural manual containing—

(1) The procedures for issuing STCs; and

(2) The names, signatures, and responsibilities of officials and of each staff member required by § 21.439(a)(4), identifying those persons who—

(i) Have authority to make changes in procedures that require a revision to the procedure manual; and

(ii) Are to conduct inspections (including conformity and compliance inspections) or approve inspection reports, prepare or approve data, plan or conduct tests, approve the results of tests, amend airworthiness certificates, issue experimental certificates, approve changes to operating limitations or Aircraft Flight Manuals, and sign supplemental type certificates.

(b) No DAS may continue to perform any DAS function affected by any change in facilities or staff necessary to continue to meet the requirements of § 21.439, or affected by any change in procedures from those approved under paragraph (a) of this section, unless that change is approved and entered in the manual. For this purpose, the manual shall contain a log-of-revisions page with space for the identification of each revised item, page, or date, and the signature of the person approving the change for the Administrator.

§ 21.443 Duration.

(a) A DAS authorization is effective until it is surrendered or the Administrator suspends, revokes, or otherwise terminates it.

(b) The DAS shall return the authorization certificate to the Administrator when it is no longer effective.

§ 21.445 Maintenance of eligibility.

The DAS shall continue to meet the requirements for issue of the authorization or shall notify the Administrator within 48 hours of any change (including a change of personnel) that could affect the ability of the DAS to meet those requirements.

§ 21.447 Transferability.

A DAS authorization is not transferable.

§ 21.449 Inspections.

Upon request, each DAS and each applicant shall let the Administrator inspect his facilities, products, and records.

§ 21.451 Limits of applicability.

(a) DAS authorizations apply only to products—

(1) Covered by the rating of the repair station applicant;

(2) Covered by the operating certificate and maintenance manual of the air carrier or commercial operator applicant; and

(3) For which the manufacturer applicant has alteration authority under § 43.3(i) of this subchapter.

(b) DAS authorizations may be used for—

(1) The issue of supplemental type certificates;

(2) The issue of experimental certificates for aircraft that—

(i) Are altered by the DAS under a supplemental type certificate issued by the DAS; and

(ii) Require flight tests in order to show compliance with the applicable airworthiness requirements of this chapter; and

(3) The amendment of standard airworthiness certificates for aircraft altered under this subpart.

(c) DAS authorizations are subject to any additional limitations prescribed by the Administrator after inspection of the applicant's facilities or review of the staff qualifications.

[(d) Notwithstanding any other provision of this subpart, a DAS may not issue a supplemental type certificate involving the acoustical change requirements of Part 36 of this chapter until the Administrator finds that those requirements are met.]

§ 21.461 Equivalent safety provisions.

The DAS shall obtain the Administrator's concurrence on the application of all equivalent safety provisions applied under § 21.21.

§ 21.463 Supplemental type certificates.

(a) For each supplemental type certificate issued under this subpart, the DAS shall follow the procedure manual prescribed in § 21.441 and shall, before issuing the certificate—

(1) Submit to the Administrator a statement describing—

(i) The type design change;

(ii) The airworthiness requirements of this chapter (by part and effective date) that the DAS considers applicable; and

(iii) The proposed program for meeting the applicable airworthiness requirements;

(2) Find that each applicable airworthiness requirement is met; and

(3) Find that the type of product for which the STC is to be issued, as modified by the supplemental type design data upon which the STC is based, is of proper design for safe operation.

(b) Within 30 days after the date of issue of the STC, the DAS shall submit to the Administrator—

(1) Two copies of the STC;

(2) One copy of the design data approved by the DAS and referred to in the STC;

(3) One copy of each inspection and test report; and

(4) Two copies of each revision to the Aircraft Flight Manual or to the operating limitations, and any other information necessary for safe operation of the product.

§ 21.473 Airworthiness certificates other than experimental.

For each amendment made to a standard airworthiness certificate under this subpart, the DAS shall follow the procedure manual prescribed in § 21.441 and shall, before making that amendment—

(a) Complete each flight test necessary to meet the applicable airworthiness requirements of this chapter;

(b) Find that each applicable airworthiness requirement of this chapter is met; and

(c) Find that the aircraft is in condition for safe operation.

§ 21.475 Experimental certificates.

The DAS shall, before issuing an experimental certificate, obtain from the Administrator any limitations and conditions that the Administrator considers necessary for safety.

§ 21.477 Data review and service experience.

(a) If the Administrator finds that a product for which an STC was issued under this subpart does not meet the applicable airworthiness requirements, or that an unsafe feature or characteristic caused by a defect in design or manufacture exists, the DAS, upon notification by the Administrator, shall investigate the matter and report to the Adminstrator the results of the investigation and the action, if any, taken or proposed.

(b) If corrective action by the user of the product is necessary for safety because of any noncompliance or defect specified in paragraph

(a) of this section, the DAS shall submit the information necessary for the issue of an Airworthiness Directive under Part 39.

§ 21.493 Current records.

(a) The DAS shall maintain, at its facility, current records containing—

(1) For each product for which it has issued an STC under this subpart, a technical data file that includes any data and amendments thereto (including drawings, photographs, specifications, instructions, and reports) necessary for the STC;

(2) A list of products by make, model, manufacturer's serial number and, if applicable, any FAA identification, that have been altered under the DAS authorization; and

(3) A file of information from all available sources on alteration difficulties of products altered under the DAS authorization.

(b) The records prescribed in paragraph (a) of this section shall be—

(1) Made available by the DAS, upon the Administrator's request, for examination by the Administrator at any time; and

(2) In the case of the data file prescribed in paragraph (a)(1) of this section, identified by the DAS and sent to the Administrator as soon as the DAS no longer operates under this subpart.

Subpart N—Approval of Engines, Propellers, Materials, Parts, and Appliances: Import

§ 21.500 Approval of engines and propellers.

Each holder or licensee of a U.S. type certificate for an aircraft engine or propeller manufactured in a foreign country with which the United States has an agreement for the acceptance of those products for export and import, shall furnish with each such aircraft engine or propeller imported into this country, a certificate of airworthiness for export issued by the country of manufacture certifying that the individual aircraft engine or propeller—

(a) Conforms to its U.S. type certificate and is in condition for safe operation; and

(b) Has been subjected by the manufacturer to a final operational check.

§ 21.502 Approval of materials, parts, and appliances.

(a) A material, part, or appliance, manufactured in a foreign country with which the United States has an agreement for the acceptance of those materials, parts, or appliances for export and import, is considered to meet the requirements for approval in the Federal Aviation Regulations when the country of manufacture issues a certificate of airworthiness for export certifying that the individual material, part, or appliance meets those requirements, unless the Administrator finds, based on the technical data submitted under paragraph (b) of this section, that the material, part, or appliance is otherwise not consistent with the intent of the Federal Aviation Regulations.

(b) An applicant for approval of a material, part, or appliance must, upon request, submit to the Administrator any technical data respecting that material, part, or appliance.

NOTE.—The recordkeeping and/or reporting requirements contained herein have been approved by the Bureau of the Budget in accordance with the Federal Reports Act of 1942.

[Subpart O—Technical Standard Order Authorizations

[§ 21.601 Applicability.

(a) This subpart prescribes—

(1) Procedural requirements for the issue of Technical Standard Order authorizations;

(2) Rules governing the holders of Technical Standard Order authorizations; and

(3) Procedural requirements for the issuance of a letter of Technical Standard Order design approval.

(b) For the purpose of this subpart—

(1) A Technical Standard Order (referred to in this subpart as "TSO") is issued by the Administrator and is a minimum performance standard for specified articles (for the purpose of this subpart, articles means materials, parts, processes, or appliances) used on civil aircraft.

(2) A TSO authorization is an FAA design and production approval issued to the manufacturer of an article which has been found to meet a specific TSO.

(3) A letter of TSO design approval is an FAA design approval for a foreign-manufactured article which has been found to meet a specific TSO in accordance with the procedures of § 21.617.

(4) An article manufactured under a TSO authorization, an FAA letter of acceptance as described in § 21.603(b), or an appliance manufactured under a letter of TSO design approval described in § 21.617 is an approved article or appliance for the purpose of meeting the regulations of this chapter that require the article to be approved.

(5) An article manufacturer is the person who controls the design and quality of the article produced (or to be produced, in the case of an application), including the parts of them and any processes or services related to them that are procured from an outside source.

(c) The Administrator does not issue a TSO authorization if the manufacturing facilities for the product are located outside of the United States, unless the Administrator finds that the location of the manufacturer's facilities places no undue burden on the FAA in administering applicable airworthiness requirements.

§ 21.603 TSO marking and privileges.

(a) Except as provided in paragraph (b) of this section and § 21.617(c), no person may identify an article with a TSO marking unless that person holds a TSO authorization and the article meets applicable TSO performance standards.

(b) The holder of an FAA letter of acceptance of a statement of conformance issued for an article before July 1, 1962, of any TSO authorizations issued after July 1, 1962, may continue to manufacture that article without obtaining a new TSO authorization but shall comply with the requirements of §§ 21.3, 21.607 through 21.615, 21.619, and 21.621.

(c) Notwithstanding paragraphs (a) and (b) of this section, after August 6, 1976, no person may identify or mark an article with any of the following TSO numbers:

(1) TSO-C18, -C18a, -C18b, -C18c.

(2) TSO-C24.

(3) TSO-C33.

(4) TSO-C61 or C61a.

§ 21.605 Application and issue.

(a) The manufacturer (or an authorized agent) shall submit an application for a TSO authorization, together with the following documents, to the Chief, Engineering and Manufacturing Branch, Flight Standards Division, of the region in which the applicant is located (or in the case of the Western Region, the Chief, Aircraft Engineering Division):

(1) A statement of conformance certifying that the applicant has met the requirements of this Subpart and that the article concerned meets the applicable TSO that is effective on the date of application for that article.

(2) One copy of the technical data required in the applicable TSO.

(3) A description of its quality control system in the detail specified in § 21.143. In complying with this section, the applicant may refer to current quality control data filed with the FAA as part of a previous TSO authorization application.

(b) When a series of minor changes in accordance with § 21.611 is anticipated, the applicant may set forth in its application the basic model number of the article and the part number of the] [components with open brackets after it to denote that suffix change letters or numbers (or combinations of them) will be added from time to time.

(c) After receiving the application and other documents required by paragraph (a) of this section to substantiate compliance with this Part, and after a determination has been made of its ability to produce duplicate articles under this Part, the Administrator issues a TSO authorization (including all TSO deviations granted to the applicant) to the applicant to identify the article with the applicable TSO marking.

(d) If the application is deficient, the applicant must, when requested by the Administrator, submit any additional information necessary to show compliance with this Part. If the applicant fails to submit the additional information within 30 days after the Administrator's request, the application is denied and the applicant is so notified.

(e) The Administrator issues or denies the application within 30 days after its receipt or, if additional information has been requested, within 30 days after receiving that information.

§ 21.607 General rules governing holders of TSO authorizations.

Each manufacturer of an article for which a TSO authorization has been issued under this Part shall—

(a) Manufacture the article in accordance with this Part and the applicable TSO.

(b) Conduct all required tests and inspections and establish and maintain a quality control system adequate to ensure that the article meets the requirements of paragraph (a) of this section and is in condition for safe operation;

(c) Prepare and maintain, for each model of each article for which a TSO authorization has been issued, a current file of complete technical data and records in accordance with § 21.613; and

(d) Permanently and legibly mark each article to which this section applies with the following information:

(1) The name and address of the manufacturer.

(2) The name, type, part number, or model designation of the article.

(3) The serial number or the date of manufacture of the article or both.

(4) The applicable TSO number.

§ 21.609 Approval for deviation.

(a) Each manufacturer who requests approval to deviate from any performance standard of a TSO shall show that the standards from which a deviation is requested are compensated for by factors or design features providing an equivalent level of safety.

(b) The request for approval to deviate, together with all pertinent data, must be submitted to the Chief, Engineering and Manufacturing Branch, Flight Standards Division, of the region in which the manufacturer is located (or in the case of the Western Region, the Chief, Aircraft Engineering Division). If the article is manufactured in a foreign country, the request for approval to deviate, together with all pertinent data, must be submitted through the civil aviation authority in that country to the FAA.

§ 21.611 Design changes.

(a) *Minor changes by the manufacturer holding a TSO authorization.* The manufacturer of an article under an authorization issued under this Part may make minor design changes (any change other than a major change) without further approval by the Administrator. In this case, the changed article keeps the original model number (part numbers may be used to identify minor changes) and the manufacturer shall forward to the appropriate Chief, Engineering and Manufacturing Branch (or in the case of the Western Region, the Chief, Aircraft Engineering Division), any revised data that are necessary for compliance with § 21.605(b).

(b) *Major changes by manufacturer holding a TSO authorization.* Any design change by the manufacturer that is extensive enough to require a substantially complete investigation to determine compliance with a TSO is a major change. Before making such a change, the manufacturer shall assign a new type or model designation to the article and apply for an authorization under § 21.605.

(c) *Changes by person other than manufacturer.* No design change by any person (other than the manufacturer who submitted the state-]

[ment of conformance for the article) is eligible for approval under this Part unless the person seeking the approval is a manufacturer and applies under § 21.605(a) for a separate TSO authorization. Persons other than a manufacturer may obtain approval for design changes under Part 43 or under the applicable airworthiness regulations.

§ 21.613 Recordkeeping requirements.

(a) *Keeping the records.* Each manufacturer holding a TSO authorization under this Part shall, for each article manufactured under that authorization, keep the following records at its factory:

(1) A complete and current technical data file for each type or model article, including design drawings and specifications.

(2) Complete and current inspection records showing that all inspections and tests required to ensure compliance with this Part have been properly completed and documented.

(b) *Retention of records.* The manufacturer shall retain the records described in paragraph (a)(1) of this section until it no longer manufactures the article. At that time, copies of these records shall be sent to the Administrator. The manufacturer shall retain the records described in paragraph (a)(2) of this section for a period of at least 2 years.

§ 21.615 FAA inspection.

Upon the request of the Administrator, each manufacturer of an article under a TSO authorization shall allow the Administrator to—

(a) Inspect any article manufactured under that authorization;

(b) Inspect the manufacturer's quality control system;

(c) Witness any tests;

(d) Inspect the manufacturing facilities; and

(e) Inspect the technical data files on that article.

§ 21.617 Issue of letters of TSO design approval: import appliances.

(a) A letter of TSO design approval may be issued for an appliance that is manufactured in a foreign country with which the United States has an agreement for the acceptance of these appliances for export and import and that is to be imported into the United States if—

(1) The country in which the appliance was manufactured certifies that the appliance has been examined, tested, and found to meet the applicable TSO designated in § 21.305(b) or the applicable performance standards of the country in which the appliance was manufactured and any other performance standards the Administrator may prescribe to provide a level of safety equivalent to that provided by the TSO designated in § 21.305(b); and

(2) The manufacturer has submitted one copy of the technical data required in the applicable performance standard through its civil aviation authority.

(b) The letter of TSO design approval will be issued by the Administrator and must list any deviation granted to the manufacturer under § 21.609.

(c) After the Administrator has issued a letter of TSO design approval and the country of manufacture issues a Certificate of Airworthiness for Export as specified in § 21.502(a), the manufacturer shall be authorized to identify the appliance with the TSO marking requirements described in § 21.607(d) and in the applicable TSO. Each appliance must be accompanied by a Certificate of Airworthiness for Export as specified in § 21.502(a) issued by the country of manufacture.

§ 21.619 Noncompliance.

The Administrator may, upon notice, withdraw the TSO authorization or letter of TSO design approval of any manufacturer who identifies with a TSO marking an article not meeting the performance standards of the applicable TSO.

§ 21.621 Transferability and duration.

A TSO authorization or letter of TSO design approval issued under this Part is not transferable and is effective until surrendered, withdrawn or otherwise terminated by the Administrator.]

Special Federal Aviation Regulation 26

Approval of Import Aircraft Engines, Propellers, Materials, Parts, and Appliances

Adopted: August 3, 1970 **Effective: August 8, 1970**

(Published in 35 F.R. 12748, August 12, 1970)

The purpose of this Special Federal Aviation Regulation (SFAR) is to provide for the approval, on a selective basis, of aircraft engines, propellers, materials, parts, and appliances, manufactured in a foreign country with which the United States has an agreement for the acceptance of powered aircraft for export and import.

Section 21.29 of Part 21 provides for the issuance of a type certificate for a product that is manufactured in a foreign country with which the United States has an agreement for the acceptance of these products for export and import and that is to be exported into the United States. Section 21.183(c) implements § 21.29 and provides for the issuance of airworthiness certificates for aircraft type certificated in accordance with § 21.29. There are 20 foreign countries with which the United States has bilateral agreements. A majority of these agreements cover aircraft and components of those aircraft imported into the United States. However, five of the agreements also cover engines and propellers that are not part of an aircraft imported into the United States and one agreement also covers appliances that are not part of an aircraft, aircraft engine, or propeller imported into the United States.

In addition to the foregoing, since § 21.183(c) provides only for the approval of aircraft type certificated under § 21.29, the FAA recently amended Part 21 to provide for the individual approval of type certificated aircraft engines and propellers being imported into the United States. Similar action was taken with respect to materials, parts, and appliances, manufactured in a foreign country. In this connection, and consistent with § 21.29, the FAA added § § 21.500 and 21.502 (Amendment 21-25, 34 F.R. 14068) which provide for the approval of aircraft engines, propellers, materials, parts, and appliances, manufactured in a foreign country with which the United States has an agreement for the acceptance of such aircraft engines, propellers, materials, parts, and appliances, for export and import. It should be noted that the term "part" includes sub-assemblies and as used in the regulations, the ordinary dictionary definition is applied to sub-assembly. Thus, an aircraft sub-assembly is a structural unit manufactured or assembled separately but designed to be incorporated with other units in the final assembly for the aircraft.

In issuing Amendment 21-25, it was anticipated that appropriate amendments to the various bilateral agreements would be accomplished to accommodate these regulations. However, the renegotiation of the pertinent bilaterals has taken longer than expected, and the new requirements have created difficulties for U.S. manufacturers who use imported aircraft engines, propellers, materials, parts, and appliances, on aircraft manufactured in the U.S. The new regulations have also created concern for various foreign manufacturers who have been granted approvals of their products, materials, parts, and appliances in the past.

In the light of the foregoing, the FAA considers that it is in the public interest to provide for the continued approval of aircraft engines, propellers, materials, parts, and appliances pending the appropriate amendment of those bilateral agreements where such amendment is in the mutual interest of the United States and the foreign country involved. This Special Federal Aviation Regulation is designed to provide for the continuance on an interim basis of such approvals. It is anticipated that the necessary amendments to the bilateral agreements will be accomplished in approximately 18 months. This regulation should have no adverse affect on safety since it limits the approval of aircraft engines, propellers, materials, parts (including sub-assemblies), and appliances, to those manufactured in a foreign country with which the United States has an agreement for the acceptance of powered aircraft for export and import provided that the Administrator (1) has previously approved a product or a material, part or appliance, manufactured in that country that is of the same kind as the product, material, part, or appliance, for which approval is requested or, in the case of a sub-assemble to be incorporated on an aircraft designed and manufactured in the U.S., has previously approved any other sub-assembly manufactured in that country and (2) has determined that the country utilizes acceptable quality control standards and certification and approval procedures. Finally, the regulation provides for the adoption of appropriate procedures in agreements between the Administrator and the competent aeronautical authorities of the various countries of manufacture for the execution of the provisions of this regulation.

In view of the immediate need for this action pending the revision of the bilateral agreements, and since this regulation relieves a restriction and imposes no additional burden on any person, notice and public procedure hereon are unnecessary and it may be made effective in less than 30 days.

In consideration of the foregoing, the following Special Federal Aviation Regulation is adopted to become effective August 8, 1970.

This Special Federal Aviation Regulation is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Special Federal Aviation Regulation 26-1

Approval of Import Aircraft Engines, Propellers, Materials, Parts, and Appliances

Adopted: February 28, 1972 **Effective: March 1, 1972**

(Published in 37 F.R. 4325, March 2, 1972)

The purpose of this amendment is to continue in effect the provisions of currently effective Special Federal Aviation Regulation No. 26 (SFAR 26) until September 1, 1972.

On August 3, 1970, the FAA adopted SFAR 26, effective August 8, 1970 (35 F.R. 12748), to provide for the approval, on a selective basis, of aircraft engines, propellers, materials, parts, and appliances, manufactured in a foreign country with which the United States has an agreement for the acceptance of powered aircraft for export and import. SFAR 26 was adopted to provide these approvals on an interim basis pending appropriate amendments to those bilateral agreements where such amendments are in the mutual interest of the United States and the foreign country involved. At the time SFAR 26 was adopted it was anticipated that the renegoiation of the bilateral agreements would be accomplished in approximately 18 months. Accordingly, a termination date of March 1, 1972, was established for SFAR 26.

The Department of State is presently in the process of negotiating amendments to the bilateral agreements with a number of foreign countries. However, the FAA is advised that those negotiations will not be concluded prior to the March 1, 1972, termination date of SFAR 26, and at least one foreign government has requested that SFAR 26 be extended pending completion of negotiations and execution of a new bilateral agreement. The reasons which justified the adoption of SFAR 26 still exist and in view of the pending negotiations the FAA believes that it is in the public interest to extend the termination date of SFAR 26 from March 1, 1972, to September 1, 1972.

Since this amendment continues in effect the provisions of a currently effective Special Federal Aviation Regulation, and imposes no additional burden on any person I find that notice and public procedure hereon are unnecessary and it may be made effective in less than 30 days.

In consideration of the foregoing, effective March 1, 1972, the last paragraph of Special Federal Aviation Regulation No. 26, published in the Federal Register (35 F.R. 12748) on August 12, 1970, is amended by striking out the words "March 1, 1972", and inserting the words "September 1, 1972", in place of thereof.

Sections 313(a), 601, and 603 of the Federal Aviation of 1958; 49 U.S.C. 1655(c).

Special Federal Aviation Regulation 26-2

Approval of Import Aircraft Engines, Propellers, Materials, Parts, and Appliances

Adopted: August 10, 1972 **Effective: September 1, 1972**

Published in 37 F.R. 16789, August 19, 1972)

The purpose of this amendment is to continue in effect the provisions of currently effective Special Federal Aviation Regulation No. 26 (SFAR 26), as amended by Amendment SFAR 26-1, until January 1, 1973.

SFAR 26 provides for approvals, on a selective basis, of aircraft engines, propellers, materials, parts, and appliances manufactured in a foreign country with which the United States has an agreement for the acceptance of powered aircraft for export and import. SFAR 26 was adopted to provide these approvals on an interim basis pending appropriate amendments to those bilateral agreements where such amendments are in the mutual interest of the United States and the foreign country involved. The originally established termination date of March 1, 1972 for SFAR 26 was extended by Amendment SFAR 26-1 to September 1, 1972.

At present time, the United States is continuing to negotiate amendments to the bilateral agreements with a number of foreign countries. However, the FAA is advised that most of the negotiations will not be concluded by the September 1, 1972 termination date of SFAR 26. The reasons which justified the adoption of SFAR still exist, and, in view of the pending negotiations, the FAA believes that it is in the public interest to extend the termination date of SFAR 26 from September 1, 1972 to January 1, 1973.

Since this amendment continues in effect the provisions of a currently effective Special Federal Aviation Regulation and imposes no additional burden on any person I find that notice and public procedure hereon are unnecessary and it may be made effective in less than 30 days.

In consideration of the foregoing, effective September 1, 1972, the last paragraph of Special Federal Aviation Regulation No. 26, published in the Federal Register (35 F.R. 12748) on August 12, 1970, as amended by Amendment SFAR 26-1, published in the Federal Register (37 F.R. 4325) on March 2, 1972, is amended by striking out the words "September 1, 1972" and inserting the words "January 1, 1973" in place thereof.

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Special Federal Aviation Regulation 26-3

Approval of Import Aircraft Engines, Propellers, Materials, Parts, and Appliances

Adopted: December 11, 1972 **Effective: January 1, 1973**

(Published in 37 F.R. 28276, December 22, 1972)

The purpose of this amendment is to continue in effect the provisions of currently effective Special Federal Aviation Regulation No. 26 (SFAR 26), as amended by Amendments SFAR 26-1 and SFAR 26-2, until July 1, 1973.

SFAR 26 provides for approvals, on a selective basis, of aircraft engines, propellers, materials, parts, and appliances manufactured in a foreign country with which the United States has an agreement for the acceptance of powered aircraft for export and import. SFAR 26 was adopted to provide these approvals on an interim basis pending appropriate amendments to those bilateral agreements where such amendments are in the mutual interest of the United States and the foreign country involved. The originally established termination date of March 1, 1972 for SFAR 26 was extended by Amendment SFAR 26-1 to September 1, 1972 and further extended by Amendment SFAR 26-2 to January 1, 1973.

At the present time, the United States is continuing to negotiate amendments to the bilateral agreements with a number of foreign countries. However, the FAA is advised that most of the negotiations will not be concluded by the January 1, 1973 termination date of SFAR 26. The reasons which justified the adoption of SFAR 26 still exist, and, in view of the pending negotiations, the FAA believes that it is in the public interest to extend the termination date of SFAR 26 from January 1, 1973 to July 1, 1973.

Since this amendment continues in effect the provisions of a currently effective Special Federal Aviation Regulation and imposes no additional burden on any person, I find that notice and public procedure hereon are unnecessary and it may be made effective in less than 30 days.

In consideration of the foregoing, effective January 1, 1973, the last paragraph of Special Federal Aviation Regulation No. 26, published in the Federal Register (35 F.R. 12748) on August 12, 1970, as amended by Amendments SFAR 26-1 and SFAR 26-2, published in the Federal Register (37 F.R. 4325 and 37 F.R. 16789) on March 2, 1972, and August 19, 1972, respectively, is further amended by striking out the words "January 1, 1973" and inserting the words "July 1, 1973" in place thereof.

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Special Federal Aviation Regulation 26-4

Approval of Import Aircraft Engines, Propellers, Materials, Parts, and Appliances

Adopted: June 26, 1973 **Effective: July 1, 1973**

(Published in 38 F.R. 17491, July 2, 1973)

The purpose of this amendment is to continue in effect the provisions of currently effective Special Federal Aviation Regulation No. 26 (SFAR 26), as amended by Amendments SFAR 26-1, 26-2, and 26-3, until January 1, 1974.

SFAR 26 provides for approvals on a selective basis, of aircraft engines, propellers, materials, parts, and appliances manufactured in a foreign country with which the United States has an agreement for the acceptance of powered aircraft for export and import. SFAR 26 was adopted to provide these approvals on an interim basis pending appropriate amendments to those bilateral agreements where such amendments are in the mutual interest of the United States and the foreign country involved. The originally established termination date of March 1, 1972, for SFAR 26 was extended by Amendment SFAR 26-1 to September 1, 1972, by Amendment SFAR 26-2 to January 1, 1973, and further extended by Amendment SFAR 26-3 to July 1, 1973.

At the present time the United States has entered into new bilateral agreements with the United Kingdom, Sweden, and Belgium and the United States is continuing to negotiate amendments to the bilateral agreements which exist with a number of other foreign countries. However, the FAA is advised that the continuing negotiations will not be concluded by the July 1, 1973, termination date of SFAR 26. The reasons which justified the adoption of SFAR 26 still exist, and, in view of the pending negotiations, the FAA believes that it is in the public interest to extend the termination date of SFAR 26 from July 1, 1973, to January 1, 1974.

Since this amendment continues in effect the provisions of a currently effective Special Federal Aviation Regulation and imposes no additional burden on any person, I find that notice and public procedure hereon are unnecessary and it may be made effective in less than 30 days.

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

In consideration of the foregoing, effective July 1, 1973, the last paragraph of Special Federal Aviation Regulation No. 26, published in the Federal Register (35 F.R. 12748) on August 12, 1970, as amended by Amendments SFAR 26-1, SFAR 26-2, and SFAR 26-3 published in the Federal Register (37 F.R. 4325, 37 F.R. 16789, and 37 F.R. 28276) on March 2, 1972, August 19, 1972, and December 22, 1972, respectively, is further amended by striking out the words "July 1, 1973" and inserting the words "January 1, 1974," in place thereof.

Special Federal Aviation Regulation 26-5

Approval of Import Aircraft Engines, Propellers, Materials, Parts, and Appliances

Adopted: December 21, 1973 **Effective: January 1, 1974**

(Published in 38 F.R. 35441, December 28, 1973)

The purpose of this amendment is to continue in effect the provisions of currently effective Special Federal Aviation Regulation No. 26 (SFAR-26), as amended by Amendments SFAR 26-1, 26-2, 26-3, and 26-4, until July 1, 1974.

SFAR 26 provides for approvals on a selective basis, of aircraft engines, propellers, materials, parts, and appliances manufactured in a foreign country with which the United States has an agreement for the acceptance of powered aircraft for export and import. SFAR 26 was adopted to provide these approvals on an interim basis pending appropriate amendments to those bilateral agreements where such amendments are in the mutual interest of the United States and the foreign country involved. The originally established termination date of March 1, 1972, for SFAR-26 was extended by Amendment SFAR 26-1 to September 1, 1972, by Amendment SFAR 26-2 to January 1, 1973, by Amendment SFAR 26-3 to July 1, 1973, and further extended by Amendment SFAR 26-4 to January 1, 1974.

At the present time the United States has entered into new bilateral agreements with the United Kingdom, Sweden, Belgium, and France and the United States is continuing to negotiate amendments to the bilateral agreements which exist with a number of other foreign countries. However, the FAA is advised that the continuing negotiations will not be concluded by the January 1, 1974, termination date of SFAR 26. The reasons which justified the adoption of SFAR 26 still exist, and, in view of the pending negotiations, the FAA believes that it is in the public interest to extend the termination date of SFAR 26 from January 1, 1974, to July 1, 1974.

Since this amendment continues in effect the provisions of a currently effective Special Federal Aviation Regulation and imposes no additional burden on any person, I find that notice and public procedure hereon are unnecessary and it may be made effective in less than 30 days.

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

In consideration of the foregoing, effective January 1, 1974, the last paragraph of Special Federal Aviation Regulation No. 26, published in the Federal Register (35 F.R. 12748) on August 12, 1970, as amended by Amendments SFAR 26-1, SFAR 26-2, SFAR

26-3, and SFAR 26-4 published in the Federal Register (37 F.R. 4325, 37 F.R. 16789, 37 F.R. 28276, and 38 F.R. 17491) on March 2, 1972, August 19, 1972, December 22, 1972, and July 2, 1973, respectively, is further amended by striking out the words "January 1, 1974," and inserting the words "July 1, 1974," in place thereof.

Special Federal Aviation Regulation 26-6

Approval of Import Aircraft Engines, Propellers, Materials, Parts, and Appliances

Adopted: June 28, 1974 **Effective: July 1, 1974**

(Published in 39 F.R. 25226, July 9, 1974)

The purpose of this amendment is to continue in effect the provisions of currently effective Special Federal Aviation Regulation No. 26 (SFAR 26), as amended by Amendments SFAR 26-1, 26-2, 26-3, 26-4, and 26-5 until January 1, 1975.

SFAR 26 provides for approvals on a selective basis, of aircraft engines, propellers, materials, parts, and appliances manufactured in a foreign country with which the United States has an agreement for the acceptance of powered aircraft for export and import. SFAR 26 was adopted to provide these approvals on an interim basis pending appropriate amendments to those bilateral agreements where such amendments are in the mutual interest of the United States and the foreign country involved. The originally established termination date of March 1, 1972, for SFAR 26 was extended by Amendment SFAR 26-1 to September 1, 1972, by Amendment SFAR 26-2 to January 1, 1973, by Amendment SFAR 26-3 to July 1, 1973, by Amendment SFAR 26-4 to January 1, 1974, and further extended by Amendment SFAR 26-5 to July 1, 1974.

At the present time the United States has entered into new bilateral agreements with the United Kingdom, Sweden, Belgium, Netherlands, Italy, Germany, and France, and the United States is continuing to negotiate amendments to the bilateral agreements which exist with a number of other foreign countries. However, the FAA is advised that the continuing negotiations will not be concluded by the July 1, 1974, termination date of SFAR 26. The reasons which justified the adoption of SFAR 26 still exist, and, in view of the pending negotiations, the FAA believes that it is in the public interest to extend the termination date of SFAR 26 from July 1, 1974 to January 1, 1975.

Since this amendment continues in effect the provisions of a currently effective Special Federal Aviation Regulation and imposes no additional burden on any person, I find that notice and public procedure hereon are unnecessary and it may be made effective in less than 30 days.

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

In consideration of the foregoing, effective July 1, 1974, the last paragraph of Special Federal Aviation Regulation No. 26, published in the Federal Register (35 F.R. 12748) on August 12, 1970, as amended by Amendments SFAR 26-1, SFAR 26-2, SFAR 26-3, SFAR 26-4, and SFAR 26-5, published in the Federal Register (37 F.R. 4325, 37 F.R. 16789, 37 F.R. 28276, 38 F.R. 17491, and 38 F.R. 35441) on March 2, 1972, August 19, 1972, December 22, 1972, July 2, 1973, and December 28, 1973, respectively, is further amended by striking out the words "July 1, 1974," and inserting the words "January 1, 1975," in place thereof.

Special Federal Aviation Regulation 26-7

Approval of Import Aircraft Engines, Propellers, Materials, Parts, and Appliances

Adopted: December 31, 1974 **Effective: January 1, 1975**

(Published in 40 F.R. 2576, January 14, 1975)

The purpose of this amendment is to continue in effect the provisions of currently effective Special Federal Aviation Regulation No. 26 (SFAR 26), as amended by Amendments SFAR 26-1, 26-2, 26-3, 26-4, 26-5, and 26-6 until July 1, 1975.

SFAR 26 provides for approvals on a selective basis, of aircraft engines, propellers, materials, parts, and appliances manufactured in a foreign country with which the United States has an agreement for the acceptance of powered aircraft for export and import. SFAR 26 was adopted to provide these approvals on an interim basis pending appropriate amendments to those bilateral agreements where such amendments are in the mutual interest of the United States and the foreign country involved. The originally established termination date of March 1, 1972, for SFAR 26 was extended by Amendment SFAR 26-1 to September 1, 1972, by Amendment SFAR 26-2 to January 1, 1973, by Amendment SFAR 26-3 to July 1, 1973, by Amendment SFAR 26-4 to January 1, 1974, by Amendment SFAR 26-5 to July 1, 1974, and further extended by Amendment SFAR 26-6 to January 1, 1975.

At the present time the United States has entered into new bilateral agreements with the United Kingdom, Sweden, Belgium, Netherlands, Italy, Germany, and France, and the United States is continuing to negotiate amendments to the bilateral agreements which exist with a number of other foreign countries. However, the FAA is advised that the continuing negotiations will not be concluded by the January 1, 1975, termination date of SFAR 26. The reasons which justified the adoption of SFAR 26 still exist, and, in view of the pending negotiations, the FAA believes that it is in the public interest to extend the termination date of SFAR 26 from January 1, 1975 to July 1, 1975.

Since this amendment continues in effect the provisions of a currently effective Special Federal Aviation Regulation and imposes no additional burden on any person, I find that notice and public procedure hereon are unnecessary and it may be made effective in less than 30 days.

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

In consideration of the foregoing, effective January 1, 1975, the last paragraph of Special Federal Aviation Regulation No. 26, published in the Federal Register (35 F.R. 12748) on August 12, 1970, as amended by Amendments SFAR 26-1, SFAR 26-2, SFAR 26-3, SFAR 26-4, SFAR 26-5, and SFAR 26-6, published in the Federal Register (37 F.R. 4325, 37 F.R. 16789, 37 F.R. 28276, 38 F.R. 17491, 38 F.R. 35441, and 39 F.R. 25228) on March 2, 1972, August 19, 1972, December 22, 1972, July 2, 1973, December 28, 1973, and July 9, 1974, respectively, is further amended by striking out the words "January 1, 1975," and inserting the words "July 1, 1975," in place thereof.

Special Federal Aviation Regulation 26-8

Approval of Import Aircraft Engines, Propellers, Materials, Parts, and Appliances

Adopted: June 30, 1975 **Effective: July 1, 1975**

(Published in 40 F.R. 28603, July 8, 1975)

The purpose of this amendment is to continue in effect the provisions of currently effective Special Federal Aviation Regulation No. 26 (SFAR 26), as amended by Amendments SFAR 26-1, 26-2, 26-3, 26-4, 26-5, 26-6, and 26-7 until July 2, 1976.

SFAR 26 provides for approvals on a selective basis, of aircraft engines, propellers, materials, parts, and appliances manufactured in a foreign country with which the United States has an agreement for the acceptance of powered aircraft for export and import. SFAR 26 was adopted to provide these approvals on an interim basis pending appropriate amendments to those bilateral agreements where such amendments are in the mutual interest of the United States and the foreign country involved. The originally established termination date of March 1, 1972, for SFAR 26 was extended by Amendment SFAR 26-1 to September 1, 1972, by Amendment SFAR 26-2 to January 1, 1973, by Amendment SFAR 26-3 to July 1, 1973, by Amendment SFAR 26-4 to January 1, 1974, by Amendment SFAR 26-5 to July 1, 1974, by Amendment SFAR 26-6 to January 1, 1975, and further extended by Amendment SFAR 26-7 to July 1, 1975.

At the present time the United States has entered into new bilateral agreements with the United Kingdom, Sweden, Belgium, Netherlands, Israel, Italy, Germany, and France, and the United States is continuing to negotiate amendments to the bilateral agreements which exist with a number of other foreign countries. However, the FAA is advised that the continuing negotiations will not be concluded by the July 1, 1975, termination date of SFAR 26. The reasons which justified the adoption of SFAR 26 still exist, and, in view of the pending negotiations, the FAA believes that it is in the public interest to extend the termination date of SFAR 26 from July 1, 1975, to July 2, 1976.

Since this amendment continues in effect the provisions of a currently effective Special Federal Aviation Regulation and imposes no additional burden on any person, I find that notice and public procedure hereon are unnecessary and it may be made effective in less than 30 days.

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

In consideration of the foregoing, effective July 1, 1975, the last paragraph of Special Federal Aviation Regulation No. 26, published in the Federal Register (35 F.R. 12748) on August 12, 1970, as amended by Amendments SFAR 26-1, SFAR 26-2, SFAR 26-3, SFAR 26-4, SFAR 26-5, SFAR 26-6 and SFAR 26-7, published in the Federal Register (37 F.R. 4325, 37 F.R. 16789, 37 F.R. 28276, 38 F.R. 17491, 38 F.R. 35441, 39 F.R. 25228, and 40 F.R. 2576) on March 2, 1972, August 19, 1972, December 22, 1972, July 2, 1973, December 28, 1973, July 9, 1974, and January 14, 1975, respectively, is further amended by striking out the words "July 1, 1975" and inserting the words "July 2, 1976" in place thereof.

Special Federal Aviation Regulation 26-9

Approval of Import Aircraft Engines, Propellers, Materials, Parts, and Appliances

Adopted: June 30, 1976 **Effective: July 2, 1976**

(Published in 41 F.R. 27954, July 8, 1976)

The purpose of this amendment is to continue in effect the provisions of currently effective Special Federal Aviation Regulation No. 26 (SFAR 26), as amended by Amendments SFAR 26-1, 26-2, 26-3, 26-4, 26-5, 26-6, 26-7, and 26-8 until July 1, 1977.

SFAR 26 provides for approvals on a selective basis of aircraft engines, propellers, materials, parts, and appliances manufactured in a foreign country with which the United States has an agreement for the acceptance of powered aircraft for export and import. SFAR 26 was adopted to provide these approvals on an interim basis pending appropriate amendments to those bilateral agreements where such amendments are in the mutual interest of the United States and the foreign country involved. The originally established termination date of March 1, 1972, for SFAR 26 was extended by Amendment SFAR 26-1 to September 1, 1972, by Amendment SFAR 26-2 to January 1, 1973, by

Amendment SFAR 26-3 to July 1, 1973, by Amendment SFAR 26-4 to January 1, 1974, by Amendment SFAR 26-5 to July 1, 1974, by Amendment SFAR 26-6 to January 1, 1975, by Amendment SFAR 26-7 to July 1, 1975, and further extended by Amendment SFAR 26-8 to July 2, 1976.

At the present time the United States has entered into new bilateral agreements with the United Kingdom, Sweden, Belgium, Netherlands, Israel, Italy, Germany, France, and Australia, and the United States is continuing to negotiate amendments to the bilateral agreements which exist with a number of other foreign countries. However the FAA is advised that the continuing negotiations will not be concluded by the July 2, 1976, termination date of SFAR 26. The reasons which justified the adoption of SFAR 26 still exist, and, in view of the pending negotiations, the FAA believes that it is in the public interest to extend the termination date of SFAR 26 from July 2, 1976 to July 1, 1977.

Since this amendment continues in effect the provisions of a currently effective Special Federal Aviation Regulation and imposes no additional burden on any person, I find that notice and public procedure hereon are unnecessary and it may be made effective in less than 30 days.

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423) and section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

In consideration of the foregoing, effective July 2, 1976, the last paragraph of Special Federal Aviation Regulation No. 26, published in the Federal Register (35 F.R. 12748) on August 12, 1970, as amended by Amendment SFAR 26-1, SFAR 26-2, SFAR 26-3, SFAR 26-4, SFAR 26-5, SFAR 26-6, SFAR 26-7, and SFAR 26-8 published in the Federal Register (37 F.R. 4325, 37 F.R. 16789, 37 F.R. 28276, 38 F.R. 17491, 38 F.R. 35441, 39 F.R. 25228, 40 F.R. 2576, and 40 F.R. 28603) on March 2, 1972, August 19, 1972, December 22, 1972, July 2, 1973, December 28, 1973, July 9, 1974, January 14, 1975, and July 8, 1975, respectively, is further amended by striking out the words "July 2, 1976" and inserting the words "July 1, 1977" in place thereof.

Special Federal Aviation Regulation 26-10

Approval of Import Aircraft Engines, Propellers, Materials, Parts, and Appliances

Adopted: July 1, 1977 **Effective: July 1, 1977**

(Published in 42 FR 35634, July 11, 1977)

SUMMARY: This amendment extends the effectivity of a current Special Federal Aviation Regulation which provides for the interim approval of certain aircraft engines, propellers, materials, parts, and appliances that are manufactured outside the United States. The extension is needed to facilitate the completion of the renegotiation of a related bilateral agreement with Japan.

FOR FURTHER INFORMATION CONTACT: Raymond E. Ramakis, Regulatory Projects Branch (AFS-940), Flight Standards Service, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, D.C., 20591, telephone (202) 755-8716.

SUPPLEMENTARY INFORMATION: SFAR 26 provides for approvals on a selective basis of aircraft engines, propellers, materials, parts, and appliances manufactured in a foreign country with which the United States has an agreement for the acceptance of powered aircraft for export and import. SFAR 26 was adopted to provide these approvals on an interim basis pending appropriate amendments to certain of those bilateral agreements where such amendments are in the mutual interest of the United States and the foreign country involved. The originally established termination date of March 1, 1972, for SFAR 26 was extended by Amendment SFAR 26-1 to September 1, 1972, by Amendment SFAR 26-2 to January 1, 1973, by Amendment SFAR 26-3 to July 1, 1973, by Amendment SFAR 26-4 to January 1, 1974, by Amendment SFAR 26-5 to July 1, 1974, by Amendment SFAR 26-6 to January 1, 1975, by Amendment SFAR 26-7 to July 1, 1975, by Amendment SFAR 26-8 to July 2, 1976, and further extended by Amendment SFAR 26-9 to July 1, 1977.

The FAA has been advised that the continuing negotiations to amend the Japanese bilateral agreement will not be concluded by the July 1, 1977, termination date of SFAR 26. The reasons which justified the adoption of SFAR 26 still exist, with respect to Japanese aircraft components and subassemblies. In view of the pending negotiations, the FAA believes that it is in the public interest to extend the termination date of SFAR 26 from July 1, 1977, to October 1, 1977, for Japanese aircraft components and subassemblies. However, the termination date of SFAR 26 will not be further extended.

Since this amendment continues in effect the provisions of a currently effective Special Federal Aviation Regulation and imposes no additional burden on any person, I find that notice and public procedure hereon are unnecessary and it may be made effective in less than 30 days.

The principal authors of this document are Mr. C. A. Christie, Flight Standards Service, and Mr. S. Podberesky, Office of the Chief Counsel.

ADOPTION OF AMENDMENT

Accordingly, effective July 1, 1977, the last paragraph of Special Federal Aviation Regulation No. 26, published in the Federal Register (35 FR 12748) on August 12, 1970, as amended by Amendments SFAR 26-1, SFAR 26-2, SFAR 26-3, SFAR 26-4, SFAR 26-5, SFAR 26-6, SFAR 26-7, SFAR 26-8, and SFAR 26-9 published in the Federal Register (37 FR 4325, 37 FR 16789, 37 FR 28276, 38 FR 17491, 38 FR 35441, 39 FR 25228, 40 FR 2576, 40 FR 28603, and 41 FR 27954) on March 2, 1972, August 19, 1972, December 22, 1972, July 2, 1973, December 28, 1973, July 9, 1974, January 14, 1975, July 8, 1975, and July 8, 1976, respectively, is further amended by striking out the words "July 1, 1977" and inserting the words "October 1, 1977, in place thereof, and by adding a new paragraph 6, that reads: "After July 1, 1977, this special regulation applies only to aircraft components and subassemblies manufactured in Japan."

[Secs. 313(a), 601, and 603, Federal Aviation Act of 1958, as amended, (49 U.S.C. 1354(a), 1421, and 1423); Sec. 6(c), Department of Transportation Act (49 U.S.C. 1655(c))]

The Federal Aviation Administration has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Order 11821, as amended by Executive Order 11949, and OMB Circular A-107.

Special Federal Aviation Regulation 26-11

Interim Approval of Import Aircraft Components and Subassemblies from Japan

Adopted: September 30, 1977 **Effective: October 1, 1977**

(Published in 42 F.R. 54408, October 6, 1977)

SUMMARY: This amendment extends the effectivity of a current Special Federal Aviation Regulation which provides for the interim approval of certain aircraft components and subassemblies that are manufactured in Japan. The extension is needed to facilitate the completion of the renegotiation of a related bilateral agreement with Japan.

FOR FURTHER INFORMATION CONTACT:

Raymond E. Ramakis
Regulatory Projects Branch
Flight Standards Service
Federal Aviation Administration
800 Independence Avenue, S.W., Washington, D.C. 20591
telephone (202-755-8716)

SUPPLEMENTARY INFORMATION: SFAR 26 provided for approvals on a selective basis of aircraft engines, propellers, materials, parts and appliances manufactured in a foreign country with which the United States has an agreement for the acceptance of powered aircraft for export and import. SFAR 26 was adopted to provide these approvals on an interim basis pending appropriate amendments to certain of those bilateral agreements where such amendments are in the mutual interest of the United States and the foreign country involved. The termination date for SFAR 26 has been extended by Amendments SFAR 26-1 through Amendment SFAR 26-10, and is currently scheduled to terminate on October 1, 1977.

At the time the current termination date of SFAR 26 was established, the negotiation of amendments to the existing bilateral agreements had been concluded with all foreign countries to the extent then involved except Japan, and the FAA believed that the Japanese bilateral agreement would be concluded by October 1, 1977. However, these negotiations will not be concluded by that date and the government of Japan has requested a 60-day extension of SFAR 26 to allow time for final negotiations and processing of the agreement in order to assure uninterrupted trade flow. The reasons which justified the adoption of SFAR 26 still exist with respect to Japanese aircraft components and subassemblies. In view of the above, the FAA believes that is in the public interest to extend the termination date of SFAR 26 from October 1, 1977, to December 1, 1977, for Japanese aircraft components and subassemblies produced under existing contracts with United States manufacturers.

Since this amendment continues in effect the provisions of a currently effective Special Aviation Regulation and imposes no additional burden on any person, I find that notice and public procedure hereon are unnecessary and it may be made effective in less than 30 days.

The principal authors of this document are N.S. Dobi, Flight Standards Service, and J. D. Jeffrey, Office of the Chief Counsel.

ADOPTION OF AMENDMENT

Accordingly, effective October 1, 1977, the last paragraph of Special Federal Aviation Regulations No. 26 (35 FR 12748), as amended by Amendments SFAR 26-1 through SFAR 26-10 (42 FR 35634), is further amended by striking out the words "October 1, 1977" and inserting the words "December 1, 1977" in place thereof, and paragraph 6 is amended to read: "After October 1, 1977, this special regulation applies only to aircraft components and subassemblies produced in Japan pursuant to contracts between Japanese manufacturers and United States product manufacturers entered into prior to October 1, 1977."

[Secs. 313(a), 601, and 603 Federal Aviation Act of 1958, as amended, (49 U.S.C. 1354(a), 1421, and 1423): Sec. 6(c), Department of Transportation Act (49 U.S.C. 1655(c)).]

The Federal Aviation Administration has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Order 11821, as amended by Executive Order 11949, and OMB Circular A-107.

Special Federal Aviation Regulation 26

Approval of Import Aircraft Engines, Propellers, Materials, Parts, and Appliances

Contrary provisions of §§ 21.29, 21.500, and 21.502 of the Federal Aviation Regulations notwithstanding—

1. A type certificate may be issued under § 21.29 for an aircraft engine or propeller manufactured in a foreign country with which the United States has a currently effective bilateral agreement for the acceptance of powered aircraft for export and import and that is to be imported into the United States if (i) a type certificate has previously been issued by the Administrator for a product manufactured in that country which is of the same kind as the product for which a type certificate is requested; and (ii) the Administrator determines that the design standards and practices, the quality control standards, and the certification procedures utilized by such country for the particular product being imported are the equivalent of those required in the United States.

2. Aircraft engines, propellers, materials, parts (including sub-assemblies), or appliances, (hereinafter referred to as aircraft components) manufactured in a foreign country with which the United States has a currently effective bilateral agreement for the acceptance of powered aircraft may be approved under § 21.500 or § 21.502, as applicable, if (i) an approval has previously been issued by the Administrator for an aircraft component manufactured in that country which is of the same kind as the aircraft component for which approval is requested; and (ii) the Administrator determines that the quality control standards and the certification and approval procedures utilized by such country for the particular aircraft component being imported are the equivalent of those required in the United States.

3. Aircraft sub-assemblies are not covered under paragraph 2 that are to be incorporated on aircraft designed and manufactured in the United States, and that are manufactured in a foreign country with which the United States has a currently effective bilateral agreement for the acceptance of powered aircraft may be approved if (i) an approval has previously been issued by the Administrator for any other sub-assembly manufactured in that country; (ii) the Administrator determines that the quality control standards and the certification and approval procedures utilized by that country for the particular sub-assembly being imported are equivalent to those required in the United States; and (iii) the competent aeronautical authorities of the country certify that the sub-assembly meets the applicable design requirements.

4. Appropriate procedures for the execution of the provisions contained in paragraphs 1., 2., and 3. of the regulation may be embodied in agreements between the Administrator and the competent aeronautical authorities of the country of manufacture of the aircraft component.

5. In the event that the Administrator determines that the quality control standards and certification and approval procedures being utilized in the foreign countries to which this regulation is applicable no longer meet the quality control and certification and approval requirements equivalent to those required in the United States, the approval given under this regulation

for the import into the United States of those aeronautical products covered by the regulation will be terminated.

6. After October 1, 1977, this special regulation applies only to aircraft components and subassemblies produced in Japan pursuant to contracts between Japanes manufacturers and United States product manufacturers entered into prior to October 1, 1977.

This special regulation shall terminate December 1, 1977, unless sooner rescinded or superseded.

This Special Federal Aviation Regulation is made under the authority of Sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of Section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Special Federal Aviation Regulation 27

Compliance With Aircraft Emission Standards Issued by Environmental Protection Agency

Adopted: December 26, 1973 **Effective: February 1, 1974**

(Published in 38 F.R. 35427, December 28, 1973)

The purpose of this Special Federal Aviation Regulation (SFAR) is to ensure compliance with aircraft and emission standards issued by the Environmental Protection Agency (EPA). Initially, this SFAR covers fuel venting and smoke number requirements issued by that agency in 40 CFR Part 87 and that originally applied beginning on January 1, 1974 but that have recently been extended to February 1, 1974 by EPA. The basis for this SFAR is § 232 of the Clean Air Act, as amended.

This action is based on a Notice of Proposed Rule Making (Notice No. 73-29) issued on October 31, 1973 and published in the Federal Register (38 F.R. 30277) on November 2, 1973. Interested persons have been afforded an opportunity to participate in the making of this regulation and due consideration has been given to all relevant matter presented.

I. *Background prior to Notice 73-29.* As stated in Notice 73-29, the FAA has been concerned with the regulatory aspects of aircraft emissions since issuance of an Advance Notice of Proposed Rule Making, entitled "Aircraft Engine Emissions" (Notice 70-15) which was published in the Federal Register (35 F.R. 5264) on March 28, 1970. Public comment was received on the development of potential regulatory policies with respect to emissions from civil aircraft. On December 31, 1970, the Clean Air Act was amended (P.L. 91-604), giving EPA responsibility for issuing emission standards applicable to emissions of air pollutants from aircraft or aircraft engines which, in the judgment of EPA, cause or contribute to or are likely to cause or contribute to air pollution which endangers the public health or welfare (§ 231 of the Clean Air Act, as amended). The Clean Air Amendments of 1970 also added § 232 to the Clean Air Act. Section 232 provides that The Secretary of Transportation, after consultation with EPA, "shall prescribe regulations to insure compliance with all standards prescribed under § 231 by the Administrator (of EPA). The regulations of The Secretary of Transportation shall include provisions making such standards applicable in the issuance, amendment, modification, suspension, or revocation of any certificate authorized by the Federal Aviation Act or the Department of Transportation Act." On May 12, 1971 (36 F.R. 8733), the functions vested in The Secretary of Transportation by Part B of Title II of the Clean Air Act, as amended (including § 232) were delegated by The Secretary to the Administrator of the FAA.

Pursuant to § 231 of the Clean Air Act, EPA on December 12, 1972 issued a Notice of Proposed Rule Making containing proposed Part 87 (37 F.R. 26488). The air transportation industry was afforded opportunity to comment on the substance and timing of the standards in EPA Part 87 that were proposed in that Notice. In addition, as prescribed in § 231 of the Act, EPA held hearings, concerning the proposed aircraft emission standards, in Boston, Massachusetts, on January 29, 1973, and in Los Angeles, California, on February 6, 1973. As EPA pointed out in the preamble to EPA Part 87, testimony was presented at the hearings by twenty-two representatives of domestic and foreign manufacturers and operators of aircraft and aircraft engines, and by other interested parties. Other comments in response to Proposed Part 87 were submitted to EPA, following the hearings, from thirty-one organizations.

In order to ensure that all persons who attended EPA's hearings, or who were otherwise interested, would know the probable effect of EPA's proposed Part 87 on the regulatory actions of the FAA, the FAA provided, at the EPA hearings in January and February, 1973, a comprehensive "Tentative FAA Regulatory Draft re: Environmental Protection Agency Proposed Aircraft Emission Standards." Public availability of this document was announced by FAA in the Federal Register on January 19, 1973 (38 F.R. 1949). Advance notice that the FAA would, if possible, make this document available had also been published in the Federal Register on December 12, 1972, as part of FAA's Notice of Participation in the EPA hearings (37 F.R. 26458). As stated in the Notice of Availability, the draft distributed at the hearings contained "detailed regulatory language that represents the kinds of FAA rule making that, under § 232 of the Clean Air Act, as amended, would have to follow the final issuance of EPA Part 87 if that part is adopted as proposed" and was made available so that "public commentators will have full knowledge of both the EPA and the probable FAA proposals prior to the hearings." The draft itself also stated that "careful review of this draft and of its relation to EPA's proposed Part 87 * * * is essential to a fully informed and constructive response, by the regulated aviation public, at the forthcoming hearings."

Following this joint effort between EPA and FAA, EPA on July 6, 1973, issued Part 87 (40 CFR Part 87) entitled "Control of Air Pollution from Aircraft and Aircraft Engines" (published in the Federal Register, 38 F.R. 19088, on July 17, 1973). That part includes fuel venting requirements that apply to all turbofan and turbojet engines with 8,000 pounds thrust or more, and smoke number requirements for JT8D engines, which originally applied beginning on January 1, 1974. On December 19, 1973, EPA issued an amendment to Part 87 that extended the effective date of the initial fuel venting and smoke requirements to February 1, 1974 and provided a regulatory basis for the issuance of temporary exemptions on or after that date [see "Temporary Exemptions From Aircraft Emission Standards (Fuel Venting and Smoke)," which, as of this date, is expected to be published shortly in the Federal Register. That amendment provides that exemptions issued by EPA will be published in the Federal Register. This SFAR is issued to ensure compliance with the EPA standards that become effective on February 1, 1974 consistent with the terms of any exemptions issued by EPA.

II. *Notice 73-29.* As stated above, Notice 73-29, entitled "Initial Compliance with Aircraft Emission Standards Issued by EPA (Smoke and Fuel Venting Emissions)" was issued by FAA on October 31, 1973. That Notice proposed regulations that would prohibit as of January 1, 1974 (the original compliance date in EPA Part 87) the certification or airworthiness approval, return to service after maintenance, and operation of airplanes (and aircraft engines) that do not comply with the fuel venting and smoke number requirements of EPA Part 87 that apply beginning on January 1, 1974. In order to reflect the statutory division of responsibility between EPA (under § 231 of the Clean Air Act, as amended) and FAA (under § 232 of that Act), the Notice did not solicit comments concerning the substance or effective date of the already final requirements of EPA Part 87, but only invited comments concerning the aspects of the proposed rules that involve FAA's use of its authority to ensure compliance with EPA Part 87. Comments concerning matters within EPA's regulatory discretion and authority were referred to that Agency. Notice 73-29 also contained procedural provisions needed to reflect the respective regulatory roles of EPA and FAA, and to reflect the preemptive effect of § 233 of the Clean Air Act, as amended (42 U.S.C. 1857 f-11) which provides that no State or political subdivision thereof may adopt or attempt to enforce any standard respecting emissions of any air pollutant from any aircraft or engine unless such standard is "identical to a standard applicable to such aircraft under this part" (Part B of Title II of the Act).

III. *Comments in response to Notice 73-29.* Numerous information copies of comments were reviewed addressing either the substance or the timing of the provisions of EPA Part 87 that were incorporated by reference in Notice 73-29. As stated above, the Notice referred such comments to EPA for consideration. As also discussed above, EPA, in response to comments concerning the provisions of EPA Part 87 that originally were to become effective on January 1, 1974, has, in addition to changing the effective date to February 1, 1974, amended Part 87 to allow for the issuance of exemptions, by EPA, to individual applicants who demonstrate that such exemptions are justified in the public interest. In this connection, § 3(b) of this SFAR provides that, if EPA takes action to issue an exemption (or other relaxation), "the new, relaxed EPA procedure or requirement, upon its effective date, is incorporated by reference in the SFAR and supersedes the provisions of this SFAR that are based on the provisions of EPA Part 87 that were relaxed by such action." This will ensure that this SFAR is implemented in a manner that is consistent with any exemptions that may be issued by EPA.

In addition to comments received concerning EPA Part 87, the following comments were received with respect to the aspects of Notice 73-29 that involve FAA's responsibility to ensure compliance with EPA's requirements:

1. It was requested that FAA postpone its requirement with respect to return to service after maintenance, rebuilding, or alteration. It was argued that much refinement of this proposed regulation is needed in order to be able to prescribe, with precision, the actions that maintenance personnel must take in order to ensure that the requirements of EPA Part 87 are not violated by the performance of maintenance, rebuilding, or alteration of aircraft or aircraft engines. The overall problem of continuing compliance is being studied by FAA, in close consultation with the EPA, to determine the most effective means of providing regulatory tools for ensuring that aircraft maintenance, rebuilding, and alteration personnel understand and, in a normal maintenance environment, can deal with test procedures and technologies associated with continuing compliance with clean air requirements. Pending, development of further regulations concerning emission inspection of in-service aircraft, the provisions of proposed § 23 requiring a demonstration of compliance with EPA Part 87 prior to approval for return to service are accordingly deleted from this SFAR. As further discussed below, compliance with applicable maintenance requirements will be accepted by the FAA as demonstrating compliance with the smoke emissions requirements of EPA Part 87 for in-use engines until testing requirements for those engines are prescribed by FAA.

2. It was requested that the applicability of the SFAR to foreign aircraft be clarified. Specifically, concern was expressed with respect to the reference, in § 1(b) of the proposed SFAR, to "foreign airworthiness certificates that are equivalent to U.S. standard airworthiness certificates." The quoted language originates in the definition of "aircraft" in § 87.1 of EPA Part 87 (i.e. " 'aircraft' means any airplane for which a U.S. standard airworthiness certificate or equivalent foreign airworthiness certificate is issued"). The FAA believes that a straight forward application of the term "equivalent" simply requires that the SFAR be applied to foreign airplanes that would be covered if they were registered in the United States. Any other policy would involve a high probability of inadvertent discriminatory application of the SFAR (either against U.S. registered airplanes or against foreign registered airplanes). FAA thus believes that the EPA definition of 'aircraft' is clear, and is simply intended to ensure that U.S. registered and foreign registered aircraft are treated equally. Any questions concerning the applicability of the SFAR to a foreign aircraft will be resolved by determining whether the aircraft, it it were certificated in the U.S., would be required by the Federal Aviation Regulations to have a U.S. standard airworthiness certificate in order to conduct the kinds of operations that are to be conducted by the foreign registered aircraft in the U.S. This clarifying language has been added to § 1(b) of the SFAR.

3. Concern was expressed that application of the terms of EPA Part 87 to certain airplanes might reduce safety. The FAA will ensure, and this SFAR requires (see § 11), that no type design or hardware modifications needed to comply with EPA Part 87 will be approved unless full compliance with applicable airworthiness standards is shown. Further, if FAA determines that compliance with any provision of EPA Part 87 may compromise safety, EPA will be notified to revise Part 87 under § 87.6 of that Part.

4. A question was raised as to whether the fuel venting emissions provisions of the SFAR could be complied with through means of compliance applied to the airframe, or whether all means of compliance must be restricted to the engine. As stated in the preamble to Notice 73–29, EPA has advised FAA, with respect to the intent of § 87.11 (and the definition of "fuel venting emissions" in § 87.1(26)), that § 87.11 was intended to control only the intentional discharge of fuel from fuel nozzle manifolds after the engines are shut down. Any means shown to prevent such discharge will be accepted, whether such means is applied to the airframe or to the engine(s). As also stated in the Notice, such means of compliance include (1) incorporation of an FAA approved system that recirculates the drained fuel back into the fuel system, (2) capping or otherwise securing the pressurization and drain (dump) valve, or (3) manually draining the fuel from a holding tank into an appropriate container. Comments requested that these means of compliance be specified in the SFAR itself rather than the preamble. This comment has merit and has been adopted (see § 14(a)). It should be noted that the list of acceptable means of compliance is not exhaustive and that any other means demonstrated to prevent the intentional discharge of fuel from

fuel nozzle manifolds after engine shutdown, will be accepted as complying with the provisions of § 87.11 of EPA Part 87 that are incorporated in this SFAR.

5. One comment expressed concern that EPA's definition of "fuel venting emissions" might be interpreted as prohibiting more than the international discharge of fuel from fuel nozzles after engine shutdown. Responsibility for interpreting the terms of EPA Part 87 rests with EPA. EPA's interpretation of the intent of § 87.11 contained in a letter from EPA to FAA, dated October 31, 1973 (which has been placed in the rules docket) interprets § 87.11 as applying only to the intentional discharge of fuel, from fuel nozzles, after engine shutdown. Section 3(d) of the SFAR provides that all interpretations of EPA Part 87 that are rendered by EPA also apply to the SFAR. In addition, the intent of this EPA interpretation is restated in § 14(a) of the SFAR.

6. Concern was expressed that installation of the Pratt and Whitney smokeless combustor on Class T-4 (JT8D) engines might not be in compliance with the applicable smoke number provisions of EPA Part 87. The issues are (1) whether or not the smoke measurement systems used to test JT8D engines equipped with the Pratt and Whitney smokeless combustor are approved by EPA under § 87.80 which provides that, in addition to the applicable smoke measurement testing procedures specified in Part 87, "other smoke measurement systems may be used if shown to yield equivalent results and if approved in advance by the Administrator" (or EPA), and (2) whether a smoke number of 30 or less was achieved under the approved equivalent smoke measurement system. EPA advised that both conditions have been met. Thus, by letter dated December 7, 1973, EPA has advised the FAA that, having reviewed tests conducted by Pratt and Whitney in 1971 and 1973 on JT8D engines incorporating reduced smoke combustors, "EPA has determined, under Subpart H, § 87.80 of EPA Part 87, that the smoke measurement systems used in these tests yield results equivalent to the results which would have been obtained under full compliance with Subpart H, § 87.80 of Part 87. The smoke numbers obtained in these tests fell below 30 and are considered to comply with the provisions of Subpart C of Part 87, which apply to new engines of Class T-4 beginning January 1, 1974." With respect to in-use engines (i.e. the many JT8D engines in service that are already equipped with the Pratt and Whitney reduced smoke combustor, and new engines with that combustor that will be introduced into service and become "in-use" engines), EPA stated, in the same letter, that EPA realizes that "Pratt and Whitney has encountered difficulty in establishing the design of a multipoint smoke sampling probe fully matching the specifications laid out in Part 87, and suitable for routine smoke testing on in-use engines. In view of this (EPA) will consider compliance with Subpart D, § 87.31(a) and (e), to have been initially demonstrated by maintenance records or other evidence showing that the reduced smoke combustors . . . have been installed. Following the development of an acceptable multipoint smoke sampling rake suitable for routine testing with (Class T-4 engines), compliance will be expected to be demonstrated by testing random samples of engines in airline service at normal overhaul periods." In view of these technical determinations by EPA, the FAA will ensure compliance with February 1, 1974, smoke number requirements of EPA Part 87 applicable to JT8D engines as follows: For "new" engines (which are defined in § 87.1(6) as engines that have never been in service), operators of airplanes equipped with those engines are required to ensure that such engines are equipped with the Pratt and Whitney reduced smoke combustor before they are placed into service (and thus become "in-use" engines). New engines equipped with that combustor will be regarded as complying with the applicable smoke number requirements of § 87.21 of EPA Part 87. With respect to "in-use" engines (which are defined in § 87.1(8) as engines that are in service), each such engine having a Pratt and Whitney reduced smoke combustor, and for which applicable maintenance requirements and complied with, will be accepted as being in compliance with the smoke number requirements of § 87.31(a) and (e) until a multipoint smoke sampling rake suitable for routine testing is readily available and the FAA has issued regulations for testing random samples of engines at normal overhaul periods.

In other respect, this Special Federal Aviation Regulation is issued for the reasons specified in Notice 73-29.

The Pratt and Whitney Engineering Change and Service Bulletins describing complying reduced smoke burners are incorporated by reference in § 14(b) of this SFAR.

These documents (P&W Engineering Change No 197707 and Service Bulletins 2417 and 2531) are available for examination by interested persons in the FAA Rules Docket AGC-24, Room 915, 800 Independence Avenue, S.W. Washington, D.C. 20591. In addition, copies may be obtained in person by writing the Director, Office of Environmental Quality, Federal Aviation Administration, 300 Independence Avenue, S.W., Washington, D.C. 20591. This will ensure that the incorporated materials are readily available to interested persons. This incorporation by reference is intended and completed by inclusion of these documents in this SFAR, and was approved by the Director of the Federal Register pursuant to 1 CFR Part 51, on December 19, 1973. It should be restated, however, that the incorporated documents merely describe acceptable means of compliance with the applicable smoke emissions requirements of this SFAR. Other means of compliance may be accepted by the FAA.

Authority. (Sections 232 and 233 of the Clean Air Act, as amended December 31, 1970, Pub. L. 91-604, sec 11(a)(1), 84 Stat. 1704 (42 U.S.C. 1857 f-10, f-11), as delegated 36 FR 8733; 40 CFR Part 87 (38 FR 19088); sec 307(c), 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1348(c), 1354(a), 1421, and 1423); sec. 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c))

In consideration of the foregoing, the following new Special Federal Aviation Regulation No. 27 is added, effective February 1, 1974, of Title 14 of the Code of Federal Regulations.

Pursuant to 1 C.F.R. Part 51, the Director of the Federal Register approved on December 19, 1973, the incorporation by reference, into SFAR 27, of Pratt and Whitney Engineering Change 19707 and Service Bulletins 2417 and 2431.

Special Federal Aviation Regulation 27-1

Compliance With Environmental Protection Agency Fuel Venting Emission Standards

Adopted: December 23, 1974 **Effective: January 1, 1975**

(Published in 39 F.R. 45008, December 30, 1974)

The purpose of this amendment to Special Federal Aviation Regulation (SFAR) No. 27 is to require compliance with Environmental Protection Agency (EPA) fuel venting emission standards that are effective beginning January 1, 1975. These EPA standards, specified in 40 CFR Part 87, apply to new and in-use aircraft turbofan or turbojet engines of less than 8,000 pounds thrust, to new and in-use aircraft turbo propeller engines, and to airplanes powered by those engines. The primary basis for this amendment is § 232 of the Clean Air Act, as amended. Editorial improvements are also made.

Notice No. 74-23 was published in the Federal Register on June 27, 1974 (39 F.R. 23271), stating that the Federal Aviation Administration was considering amending SFAR 27 to require compliance with certain EPA fuel venting emission standards made effective by that Agency on January 1, 1975. Interested persons were afforded an opportunity to participate in the proposed rule making. Due consideration was given to all relevant matter presented.

Five comments were received in response to the notice with two commentators objecting. One commentator stated that the proposed regulation would have no marked effect on the environment and was merely "regulation for regulation's sake." According to the commentator, the great majority of aircraft affected by the proposal are already in compliance with the proposed standards. In addition, the commentator objected to one of the means of complying with the regulation, that is, manually draining the fuel from a holding tank into a container. The commentator stated that this means of compliance did not control how the drained fuel is disposed of.

With respect to the environmental benefits of the substantive standards of EPA Part 87 that are added to SFAR 27 by this amendment, this factor was considered by

EPA in its promulgation of Part 87. Regarding the ground handling of fuel after it is drained into a container, this issue involves airport fuel shortage and ground fuel management practices that may justify future study. The FAA invites comments concerning the contribution of specific ground fuel handling practices to air quality deterioration, including suggestions concerning means of ensuring that drained fuels are not later evaporated into the atmosphere, thus defeating the intent of the fuel venting emissions regulations.

One commentator addressed the applicability of this amendment to foreign registered aircraft operated in the United States. This commentator stated that "unilateral regulation such as this proposed would be contrary to certain obligations assumed by the United States as a party to the Chicago Convention and to a number of bilateral air transport agreements." The commentator referred to § 1 of the SFAR which, pursuant to § 87.3 of EPA Part 87, provides that the SFAR "does not apply where inconsistent with an obligation assumed by the United States to a foreign country in a treaty, convention, or agreement." The commentator suggested that standards, such as those in this amendment, should be devleoped internationally through the International Civil Aviation Organization. The FAA agrees that it is most desirable that the introduction of standards affecting international civil aviation be accomplished in an orderly fashion through the development of international standards. However, it is the position of the U.S. that no international treaties, conventions, or agreements currently prevent the FAA from exercising its duties under the Clean Air Act Amendments of 1970 and EPA Part 87. Therefore, SFAR 27, including this and subsequent amendment, must be applied to foreign airplanes as prescribed in § 1 of the SFAR.

In response to the fuel venting emissions provisions of EPA Part 87 that become effective on January 1, 1975 (namely Subpart B of EPA Part 87), this amendment adds definitions of "Class T1," and "Class P2" engines that are identical to those in § 87.1 of EPA Part 87, and adds references to those engine classes, and to the compliance date (January 1, 1975) in the appropriate sections of the SFAR.

Finally, editorial changes are made to the regulation. One editorial change restructures the paragraphs containing the references to the incorporated provisions of EPA Part 87 in order to standardize the form of those references where possible.

Another editorial change eliminates possible confusion concerning the effect of § 14(a) on the fuel venting emissions requirements of the SFAR. Section 14(a) states that compliance with the applicable fuel venting provisions "may be shown by any means of compliance, applied to the airframe or engine, that prevents..." However, the subsequent sections of the SFAR could be individually read as requiring that fuel venting emissions compliance must be shown for the engine (and may not be shown for the airframe alone). This is not intended. To ensure that there is no question that the required means of showing compliance with the applicable fuel venting emissions requirements may be applied to the airframe or engine, the words "airframe or engine" are added to the fuel venting emissions requirements. Consistent with this intent, the requirement in § 19 of the SFAR that fuel venting emissions requirements be met as a condition to the issuance of an airworthiness approval tag (FAA Form 8130-3) is deleted for two reasons: First, it is meaningless as a general requirement since § 14(a) provides that fuel venting emissions requirements need not be met by engines if airframe modifications show compliance. Second, it is redundant since, under § 25 of the SFAR, if the airframe does not comply with fuel venting emissions requirements, and the engine also does not comply, the airplane may not be operated. There is, thus, no need to apply the fuel venting emissions requirement at the engine airworthiness approval tag stage. Similarly, since, as stated above, the effect of § 14(a) is that an engine need not comply with any of the fuel venting emissions requirements of the SFAR if the airframe complies, and since airplane type certification approves the complete airplane (including its engines), the lead-in paragraphs of §§ 15 and 17 (concerning the issuance of type certificates, amended type certificates and supplemental type certificates) have been revised to refer only to certification of the airplane. No substantive change in practice results from these changes to §§ 15, 17, and 19 since they merely bring those sections into closer conformity with the intent of § 14(a), which already applies throughout the SFAR. Further notice and public procedure on these changes is, therefore, unnecessary.

As stated above, the requirements of 10 CFR Part 87 that are incorporated in this amendment become effective beginning on January 1, 1975. Section 232 of the Clean Air Act, as amended (42 U.S.C. 1857 f-10) requires the Secretary of Transportation to prescribe regulations to insure compliance with all standards prescribed under § 231 of that Act (42 U.S.C. 1857 f-9), which include the newly incorporated provisions of Part 87. Accordingly, this amendment must be effective no later than January 1, 1975. Good cause, therefore, exists for making this amendment effective less than 30 days after publication in the Federal Register.

Authority: [Section 232, Clean Air Act, as amended December 31, 1970, P.L. 91-604 (42 U.S.C. 1857 f-10), as delegated (36 F.R. 8733); 40 CFR 87 (39 F.R. 19088); sections 307(c), 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1348(c), 1354(a), 1421, and 1423; section 6(c), Department of Transportation Act (49 U.S.C. 1655(c))].

Special Federal Aviation Regulation 27-2

Compliance With Environmental Protection Agency Exhaust Emissions (Smoke) Standards

Adopted: November 23, 1975 **Effective: January 1, 1976**

(Published in 40 F.R. 55311, November 28, 1975)

The purpose of this amendment to Special Federal Aviation Regulation (SFAR) 27 is to require compliance with Environmental Protection Agency (EPA) standards for exhaust emissions of smoke that are effective beginning January 1, 1976. These EPA standards, specified in 40 CFR Part 87, apply to new and in-use aircraft turbofan or turbojet engines that are designed for subsonic airplanes and that have a rated power of 29,000 pounds thrust or greater. Foreign, as well as U.S. registered, civil airplanes are affected. The primary basis for this amendment is § 232 of the Clean Air Act, as amended.

Notice No. 75-34 was published in the *Federal Register* on September 16, 1975, (40 F.R. 42754), stating that the Federal Aviation Administration (FAA) was considering amending SFAR 27 to require compliance with EPA standards for exhaust emissions of smoke that are effective beginning January 1, 1976.

These standards, as currently prescribed in 40 CFR Part 87, apply to new and in-use aircraft turbofan or turbojet engines that are designed for subsonic airplanes and that have a rated power of 29,000 pounds thrust or greater. Interested persons were afforded an opportunity to participate in the proposed rulemaking. Due consideration was given to all relevant matter presented.

Ten comments were received in response to the Notice. Three commenters objected to U.S. action affecting foreign registered aircraft operated in the United States, and stated that the U.S. is seeking to apply the standards of SFAR 27 to these aircraft prior to an international agreement thereon. The FAA believes, as stated in response to a similar comment on the Notice proposing amendment SFAR 27-1, that it would be desirable that the introduction of standards affecting international civil aviation be accomplished in an orderly fashion through the development of international standards. However, it is the position of the United States that no international treaties, conventions, or agreements currently prevent the FAA from discharging its responsibilities under the Clean Air Act, as amended, in accordance with the EPA standards prescribed in 40 CFR Part 87. Therefore, as previously stated, SFAR 27, including this and subsequent amendments, must be applied to foreign aircraft as prescribed herein.

Several commenters suggested that, since § 14(b) now reads in part: "Compliance with the exhaust emissions requirements of this SFAR that apply to Class T-4 engines beginning on February 1, 1974, is shown if the engine is either a JT8D-11 or JT8D-15 or . . .," compliance with these additional smoke requirements for Class T2 of, or more than, 29,000 pounds thrust should be shown in the same manner. The 1974 requirements applied to only one engine type, the JT8D, which could easily be handled in the regulations as a separate item. There are currently three engine types (the JT9D, CF6, and RB 211) within Class T2, and there may be applications for certification of additional engine types within this class and thrust range. Therefore, the more generalized language identifying the engine class, rather than the engine type, is used to designate which engines, including modifications, must conform to these standards.

One commenter was concerned that § 14(d), in conjunction with § 14(c), would imply that the FAA wants to witness the airlines' maintenance programs, and suggested that, as there are no present requirements for continuous monitoring of emissions, this section should be deleted or confined solely to engine certification testing conducted by the manufacturer. The FAA disagrees with this comment. SFAR 27 should contain, for the specific purpose of emissions testing, the same kind of FAA monitoring authority that is now exercised with respect to airworthiness and related testing or compliance programs. Section 14(d) is, therefore, adopted as proposed.

Several commenters were concerned that the proposed amendment contained no guidelines concerning the submission of engine test data that would be required to show compliance. The proposed amendment is explicit as to the maximum smoke number allowable for any class T2 engine of or over 29,000 pounds thrust, and clearly states that the "related test procedures" must be those prescribed by the EPA in 40 CFR Part 87. Further definition of compliance is not deemed necessary to this amendment. The FAA has a current program to develop correction procedures that would compensate for atmospheric variations. The results of these efforts will be reviewed to determine whether additional rule making is necessary.

One commenter stated that there was no specific requirement that foreign-built engines must comply with the proposed amendment. Section 1 of SFAR 27 states that the SFAR applies to both U.S. and foreign airplanes. Thus, there is no need to repeat the applicability to foreign aircraft in each amendment.

One commenter suggested that proposed §15(b) be amended to apply the standards to each engine type, or type design, rather than "the engine." The FAA believes that it is clearly understood, throughout the type certification regulations, that compliance with those regulations involves compliance of the type design therewith. Further specificity is, therefore, not believed to be necessary in this regard. This proposal is, therefore, adopted as proposed.

One commenter proposed that § 14(c) include a reference to overhaul rework standards, in addition to maintenance requirements. The FAA does not consider this addition necessary since overhaul rework standards are included in the general term "applicable maintenance requirements."

This amendment adds a new paragraph (b) to section 17 (and reorganizes the current text of that section as paragraph (a)) providing that compliance with the applicable exhaust emissions requirements of 40 CFR Part 87 must be shown for the issuance of supplemental or amended type certificates for engines. This change was not specifically proposed in the Notice. However, current SFAR 27 prohibits the operation in the U.S. of any airplane unless each engine complies with the EPA exhaust emissions standards that apply beginning February 1, 1974 (§ 25). The regulation also prohibits the issuance of airworthiness approval tags to individual engines that do not meet those February 1, 1974 standards (§ 19). The Notice proposed to expand those sections to cover new and in use engines with respect to the EPA exhaust emissions standards that apply beginning January 1, 1976. After reviewing these current and proposed requirements affecting individual engines, the FAA believes that it may be misleading to issue supplemental or amended type certificates for engines that cannot legally operate and for which no airworthiness approval tag can be issued. Therefore, to ensure consistency with these other provisions and avoid inducing applicants into supplemental or amended type certification programs for engines whose operation cannot be permitted because of the scope of EPA Part 87, this amendment provides that the FAA will not issue supplemental or amended type certificates for engines that do not meet the applicable EPA standards. This is consistent with § 15(b) which requires compliance with the same applicable EPA standards as a condition to the issuance of original type certificates for engines.

Authority: [Section 232 of the Clean Air Act, as amended December 31, 1970, P.L. 91-604 (42 U.S.C. § 1857f-10), as delegated (36 FR 8733); 40 CFR Part 87 (38 FR 19088); sections 307(c), 313(a), 601 and 603 of the Federal Aviation Act of 1958 (49 U.S.C. §§ 1348(c), 1354(a), 1421, and 1423); section 6(c) of the Department of Transportation Act (49 U.S.C. § 1655(c))].

In consideration of the foregoing, Special Federal Aviation Regulation (SFAR) 27 is amended, effective January 1, 1976.

Special Federal Aviation Regulation 27-3

Compliance with EPA Exhaust Emission (Smoke) Standard for JT3D Engines Manufactured on or After January 1, 1978

Adopted: December 21, 1977 **Effective: January 1, 1978**

(Published in 42 FR 64876, December 29, 1977)

SUMMARY: This amendment defines "date of manufacture" for purposes of the rule, establishes a requirement for marking each aircraft engine for which emission standards are prescribed, and ensures compliance with the exhaust emission (smoke) standards issued by the Environmental Protection Agency (EPA) that apply to new Pratt and Whitney JT3D engines manufactured on or after January 1, 1978. The issuance of this amendment is required by the Clean Air Act, as amended.

FOR FURTHER INFORMATION CONTACT:

Emanuel M. Ballenzweig, Assistant Chief, High Altitude Pollution Staff (AEQ-10), Office of Environmental Quality, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, D.C. 20591; telephone (202) 425-8933.

SUPPLEMENTARY INFORMATION:

HISTORY

On July 21, 1977, the FAA published Notice No. 77-13 in the FEDERAL REGISTER (42 FR 37413) proposing amendments of the aircraft emissions rules in Special Federal Aviation Regulation (SFAR) 27 in order to ensure compliance with the aircraft emission (smoke) standard issued by the Environmental Protection Agency (EPA) that is effective January 1, 1978. Comments were invited on the proposal.

Under § 232 of the Clean Air Amendments of 1970, Pub. L. 91-604, the FAA has a duty to issue regulations that ensure compliance with all aircraft emissions standards promulgated by EPA under § 231 of the Act, which are currently prescribed in EPA Regulations Part 87 (40 CFR Part 87) issued on July 6, 1973, and published in the FEDERAL REGISTER (38 FR 19038) on July 17, 1973.

Accordingly, on December 26, 1973, the FAA issued Special Federal Aviation Regulation (SFAR) 27, published in the FEDERAL REGISTER (38 FR 35437) on December 28, 1973. The purpose of SFAR 27 is to ensure compliance with aircraft and aircraft engine emission standards and test procedures issued by the EPA in EPA Part 87.

The SFAR, as originally issued, incorporated only those standards and procedures in EPA Part 87 that were effective beginning February 1, 1974. On December 23, 1974 the FAA issued Amendment SFAR 27-1 to SFAR 27 (39 FR 45008; December 30, 1974) which incorporated the fuel venting emission standards in EPA Part 87 that were effective beginning January 1, 1975. A second amendment, SFAR 27-2, was issued on November 23, 1975, and published in the FEDERAL REGISTER on November 28, 1975 (40 FR 55311). That amendment incorporated smoke emission standards in EPA Part 87 applicable to new and in-use aircraft turbofan or turbojet engines designed for subsonic airplanes that have a rated power of 29,000 pounds thrust or greater, effective January 1, 1976.

DISCUSSION OF RULE

As stated above, the FAA, in Notice No. 77-13, proposed to add to SFAR-27 the provisions of EPA Part 87 that apply, beginning January 1, 1978. These provisions apply to engines specified in § 87.21(c) of EPA Part 87 (40 CFR 87.21(c)). That rule provides that the exhaust emissions of smoke from each new Class T3 engine (which, as defined in § 87.1(a) of EPA Part 87, is limited to engines of the JT3D model family; "manufactured" on or after January 1, 1978, shall not exceed a smoke number of 25 (as determined in accordance with the test procedures of EPA Part 87). Only four comments were received. The comments concerned the application of aircraft emission standards to airplanes being exported, and the method of identifying and approving engines. These comments are addressed in the following discussions.

DATE OF "MANUFACTURE"

The Notice proposed to amend §§ 15, 17, 21, and 25 by adding a reference to the January 1, 1978, EPA standards for all engines "manufactured" on and after that date. As stated in the preamble to the Notice, the intent was to make it clear that the date of FAA approval of an engine for installation on an aircraft is the date that the FAA regards an engine as "manufactured" (as that term is used in EPA Part 87). Further review indicates that, in parallel fashion, a foreign manufactured engine should also be regarded as "manufactured" on the date that the foreign country of manufacture issues an approval equivalent to that issued by the FAA. Considering these factors, the word "manufactured," as used in the Notice, is defined in a new § 12. Accordingly, in amended § 15, the phrase "manufactured on or after January 1, 1978" refers to engines which, on or after January 1, 1978, are originally approved by the FAA, or by a foreign country of manufacture, for installation on airplanes. The new definition in § 12 makes it clear that the date of approval of each individual engine, not the date of approval of the type design, is the controlling date. The words "original" and "originally" are used to make it clear that the date that an in-use engine is approved for installation on airplanes, following rebuliding or maintenance, is not relevant. This discussion also applies to the amendments to §§ 17, 21, and 25.

For the same reasons, and consistent with the proposal to express date of "manufacture" in terms of approval dates, § 19 is also amended to make it clear that issuance of an original FAA approval for installation of an engine on an airplane (including FAA acceptance of an equivalent approval by a foreign country of manufacture) is contingent upon compliance with applicable emission standards. This applies with respect to any EPA standard that relates to the date of "manufacture" of an aircraft engine (as defined in § 12), and that is added later to this SFAR, not only the standard being incorporated by this amendment. See also the discussion below concerning the forms of FAA-approval.

FORMS OF ENGINE APPROVAL

The Notice proposed to add the words "or other FAA approval for installation of an engine on aircraft" following the reference to "airworthiness approval tag" in § 19. This reflected the fact that FAA approvals of engines are not limited to airworthiness approval tags. Further review of this proposal indicates that all references to airworthiness approval tags can be deleted since they are clearly covered by the broad reference to "FAA approval for installation of an engine on an airplane." In addition, for engines manufactured in a foreign country with which the United States has an agreement for the acceptance of the engine (See § 21.500 of Part 21 of the Federal Aviation Regulations, 14 CFR Part 21), the FAA approval is exercised in the form of FAA acceptance of an approval issued by the country of manufacture. To prevent possible confusion, it is believed that this form of FAA approval should be clearly set forth. Accordingly, the provisions of § 19, as amended, refer to "original FAA approval for installation of an engine on airplane (including FAA acceptance of an equivalent original approval issued by a foreign country of manufacture...)." The word "aircraft" (proposed in the Notice) is changed to "airplane" since the definition of "aircraft" in § 87.1(a) (3) of EPA Part 87 is limited to "airplane."

MARKING OF ENGINES

The Notice proposed to add new paragraphs (b) and (c) to § 19 to require that engines be permanently marked to identify the date of manufacture, and (for noncomplying engines) to require that the identification plate for the engine contain a statement that the "need for emission compliance must be determined before installation." FAA review of comments indicates that the intent of the proposal (which is to facilitate ready identification of engines that should not be installed or operated in airplanes) can be expressed more clearly and achieved with less burden on manufacturers. Several comments indicate concern with the limited space available on an engine for placing identification data and with the proposed statement regarding the need to determine compliance with applicable standards before installation of the engine on an airplane. Some commenters noted that the proposed statement would not indicate the basis for the required determination. The FAA agrees that the rule as proposed would not result in the most efficient use of the available space for marking critical information on an engine. It is believed that the purpose of the proposal can be more efficiently achieved, with less impact on manufacturers, by requiring that the model designation (which is already required to be on the identification plate) correspond to approved type design data indicating whether applicable emission standards are complied with. As adopted, this identification requirement applies only to engines that are covered by FAA emission regulations that become effective on or after January 1, 1978. It should be noted that, like that proposed in the NPRM, this requirement is not limited to the new JT3D engines being added by this amendment, but also applies to engines subject to any emission standards that are added to SFAR 27 after January 1, 1978. Since a particular engine type may be required to comply with a series of emission standards during a long production run, this provision is intended to allow the installer (such as maintenance personnel and aircraft operators) to readily determine, by reference to the type certificate data for each model designation, whether a particular engine may be installed or operated after the compliance dates prescribed by EPA.

CONTINUING COMPLIANCE

As is the case under the current provisions in SFAR 27 concerning smoke emissions, compliance with the smoke emissions requirements for Class T3 engines manufactured on or after January 1, 1978, may, under this amendment, be shown by equipping the affected engines with approved combustors of a design that has been shown to result in the engine meeting the applicable smoke number, and by maintaining the engines in accordance with applicable airworthiness maintenance requirements. Accordingly, as proposed in the Notice, the January 1, 1978, date is added to § 14(c) and the text of that paragraph is consolidated to eliminate duplication. If additional requirements to detect and prevent deterioration of smoke emissions characteristics during the service life of an engine should become necessary, production line testing of sample engines, periodic testing of in-use engines, or similar regulations necessary to ensure compliance with these standards will be proposed by the FAA in a later rule-making action.

EXPORT AIRCRAFT

One commenter discussed the applicability of SFAR 27 to the exporting of aircraft with standard airworthiness certificates (or their foreign equivalent) for use "exclusively" outside the U.S. when the importing country does not require emission controls. The commenter suggested that SFAR 27 be amended to state clearly that it applies only to foreign civil airplanes that are routinely operated within the United States. The commenter stated that the FAA could not make this change to SFAR 27 unless EPA first made a similar change to its Part 87. (A letter requesting such a change has been sent to EPA by the commenter.) The FAA, agrees that if EPA agrees with this request, the appropriate means of narrowing the applicability of SFAR 27, with respect to EPA standards already incorporated in it, would be to change EPA Part 87 by narrowing the application of the standards for aircraft emissions with respect to certain clearly specified classes of operation which are determined by EPA not to significantly affect air quality inside the United States. The FAA will continue to work with EPA to resolve this issue, since under Section 232 of the Clean Air Act, the Department of Transportation must "insure compliance with all standards" issued by EPA. In this connection, § 3 of SFAR 27 provides that, if EPA relaxes Part 87, that relaxation is incorporated in the SFAR automatically, without further action by FAA.

EFFECTIVE DATE

As stated above, the requirements of 40 CFR Part 87 that are incorporated in this amendment become effective beginning on January 1, 1978. Section 232 of the Clean Air Act, as amended (42 U.S.C. § 1857f-10), requires the FAA to prescribe regulations to ensure compliance with all standards prescribed under § 231 of that Act (42 U.S.C. § 1857f-9) which include the newly incorporated provisions of EPA Part 87. Accordingly, this amendment must be effective no later than January 1, 1978. Good cause, therefore, exists for making this amendment effective in less than 30 days after publication in the FEDERAL REGISTER.

DRAFTING INFORMATION

The principal authors of this document are Emanuel M. Ballenzweig, Office of Environmental Quality, and Richard W. Danforth, Office of the Chief Counsel.

ADOPTION OF THE AMENDMENT

Accordingly, Special Federal Aviation Regulations (SFAR) 27 of the Federal Aviation Regulations is amended, effective January 1, 1978.

(Sec 232, Clean Air Act, as amended December 31, 1970, Pub. L. 91-604 (42 U.S.C. § 1857f-10), as delegated (36 FR 8733); 40 CFR Part 87 (38 FR 19088); Secs. 307(c), 313(a), 601 and 603, Federal Aviation Act of 1958 (49 U.S.C. §§ 1348(c), 1354(a), 1421, and 1423; Sec. 6(c) Department of Transportation Act (49 U.S.C. § 1655(c)).)

The Federal Aviation Administration has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Order 11821, as amended by Executive Order 11949, and OMB Circular A-107.

Special Federal Aviation Regulation 27-4

Compliance With EPA Smoke Emissions Standard for In-Use JT3D Engines

Adopted: October 23, 1980 **Effective: December 1, 1980**

(Published in 45 FR 71960, October 30, 1980)

SUMMARY: This amendment to the FAA airplane emissions rules requires compliance with the aircraft and aircraft engine emissions (smoke) standards for in-use JT3D engines in accordance with the compliance schedule established on October 30, 1979, by the U.S. Environmental Protection Agency (EPA) under 40 CFR Part 87 (44 FR 64266, November 6, 1979). This amendment covers all civil JT3D powered aircraft operated in the United States with a U.S. standard airworthiness certificate (or foreign equivalent). It reflects the EPA's extension of compliance deadlines to be more, though not completely, compatible with the FAA's aircraft operation noise limits rule applicable to certain JT3D-powered aircraft in domestic service (14 CFR Part 91, Subpart E). It requires timely modification by all U.S. foreign operators of in-use JT3D engines manufactured before January 1, 1978, in accordance with a phased compliance schedule. That schedule prescribes intermediate compliance dates of January 1, 1981, and January 1, 1983; with full compliance beginning January 1, 1985. JT3D engines manufactured on or after January 1, 1978, are already required by EPA to meet those engine emission standards. This FAA rulemaking action is required by Section 232 of the Clean Air Act, as amended in 1970 by Pub. L. 91-604 (42 U.S.C. § 1857f-10).

FOR FURTHER INFORMATION CONTACT:

For information concerning enforcement of SFAR 27 which implements 40 CFR Part 87: Mr. Emanuel M. Ballenzweig, Air Quality Division (AEE-300), Office of Environment and Energy, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, D.C. 20591; (202) 755-8933.

For information concerning the substance of 40 CFR Part 87: Mr. George Kittredge, Office of Mobile Source Air Pollution Control, AW455, Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460; (202) 426-2514.

SUPPLEMENTARY INFORMATION:

REGULATORY HISTORY

On April 14, 1980, the FAA published Notice No. 80-6 (45 FR 25350) proposing to amend SFAR 27, "Fuel Venting and Exhaust Emission Requirements for Turbine Engine Powered Airplanes." That notice proposed amendments to ensure compliance with the EPA emissions standards for in-use JT3D engines. Interested persons were invited to participate in this rulemaking by submitting written comments on the proposed rule. The notice recognized the division of regulatory responsibility between the EPA (under § 231 of the Clean Air Act, as amended, 42 U.S.C. § 1857f-9) and the Secretary of Transportation (under § 232 of that Act, 42 U.S.C. § 1857f-10). Therefore, comments were not requested concerning the substance or the compliance dates of the already final requirements of the EPA's Part 87 that were incorporated in the FAA proposal. Since such comments would involve EPA's regulatory authority, over which the FAA has no control, they should have been submitted directly to the EPA prior to finalization of the most recent amendment to the EPA standards issued on October 30, 1979. Nevertheless, most comments received addressed those issues over which the FAA has no authority. These were referred to the EPA for consideration. All comments received have been given full consideration in the promulgation of this amendment which, after consultation with the EPA, adopts the proposals in Notice No. 80-6 without substantive change.

Under § 232 of the Clean Air Amendments of 1970, Pub. L. 91-604, the FAA must issue regulations to ensure compliance with all aircraft emissions standards promulgated by the EPA under § 231 of the Act. The EPA regulations are currently prescribed under 40 CFR Part 87 originally published in the *Federal Register* on July 17, 1973 (38 FR 19088). Accordingly, on December 26, 1973, the FAA issued Special Federal Aviation Regulation (SFAR) 27, (38 FR 35437, December 28, 1973). The purpose of SFAR 27 is to fulfill FAA statutory responsibilities to ensure compliance with aircraft and aircraft engine emissions standards and related test procedures under EPA's (40 CFR) Part 87.

SFAR 27, as originally issued, governed compliance of only those standards and procedures in EPA Part 87 that were effective beginning February 1, 1974. On December 23, 1974, the FAA amended SFAR 27 (Amdt. SFAR 27-1: 39 FR 45008, December 30, 1974) to regulate compliance with the fuel venting standards in EPA Part 87 that became effective January 1, 1975. Amendment SFAR 27-2, effective January 1, 1976 (40 FR 55311, November 28, 1975), governs compliance with smoke emissions standards in EPA's Part 87 applicable to new and in-use aircraft turbofan or turbojet engines with a rated power of 29,000 pounds thrust or greater, that are designed for operation on subsonic airplanes. A third amendment (Amdt. SFAR 27-3; 42 FR 64876, December 29, 1977) regulates compliance of JT3D engines manufactured on and after January 1, 1978, with smoke emissions standards in EPA's Part 87.

DISCUSSION OF THE AMENDMENT

Overview

This amendment to SFAR-27, pursuant to the Clean Air Amendments of 1970, requires compliance with the EPA's Part 87 exhaust emission (smoke) requirements that apply to "in-use" JT3D engines on EPA's prescribed phased compliance schedule (40 CFR 87.31(c)). It provides that the exhaust emissions of each in-use Class T3 engine, specified under § 87.1(a) as "gas turbine engines of the JT3D Model family," may not exceed a smoke number of 25, when measured in accordance with the related test procedures under EPA's Part 87. To meet these smoke requirements for Class T3 engines requires a retrofit or a replacement of the combustor in JT3D engines manufactured before January 1, 1978. Those manufactured on or after that date must already comply.

That provision of EPA's Part 87 affecting in-use JT3D engines was originally scheduled to take effect January 1, 1978. As a result of a petition from the Air Transport Association of America (ATA), the EPA relaxed the compliance schedule to permit 90 percent compliance by September 1, 1980, with full compliance by September 1, 1981 (41 FR 54861, December 15, 1976). Subsequent to an FAA suggestion, the EPA again amended the compliance schedule (44 FR 64266; November 6, 1979). The new schedule coincides with 14 CFR 91.305, the FAA's phased schedule for noise compliance by U.S. operators of JT3D-powered airplanes operated domestically under FAR Parts 121 and 135 (43 FR 12815, March 24, 1978). It should be noted that the phased compliance schedule in EPA's Part 87 applies to all civil JT3D-powered airplanes that operate in the United States under a U.S. standard airworthiness certificate (or foreign equivalent). Thus, it applies equally to U.S. and foreign operators of those airplanes with JT3D engines. The compliance schedule precribed under 40 CFR 87.31(c) is as follows:

"(c) Exhaust emissions of smoke from each in-use aircraft gas turbine engine of Class T3 shall not exceed a smoke number of 25. Each operator shall achieve compliance in accordance with the following schedule:

(1) One quarter of its operational Class T3 engines by January 1, 1981.

(2) One half of its operational Class T3 engines by January 1, 1983.

(3) All of its operational Class T3 engines by January 1, 1985.

"This compliance schedule notwithstanding, Class T3 engines which do not meet a smoke number of 25 may continue to be operated if, under an FAA approved plan, replacement engines or replacement airplanes have been ordered and are scheduled for delivery prior to January 1, 1985, but not after the dates specified in the plan. For the purpose of this paragraph, replacement engines are engines of a class different from Class T3 and have been shown to meet the smoke emission standards in this part appropriate to their class."

This amendment to SFAR 27 requires compliance in accordance with 40 CFR 87.31(c) and, thus, the FAA has no discretion in establishing or modifying the rule in areas such as (1) the regulated persons, engines, or airplanes; (2) the emissions standards; or (3) the compliance schedule. Many commenters to the notice opposed the unilateral actions being taken by the United States that they considered to be counter to International Civil Aviation Organization (ICAO) and European Civil Aviation Conference (ECAC) positions which oppose emissions standards that require modification to in-service aircraft engines. The EPA's response to those comments is contained in the preamble of the final rulemaking taken by EPA with regard to JT3D smoke emissions standards (44 FR 64266, November 6, 1979). The EPA rejected those arguments at that time because that rulemaking represented a delay in the effective dates of a standard that had been promulgated in 1973 which antedated any positions taken by ICAO Committees or by the ECAC. Other commenters considered the phased compliance schedule to be burdensome and wanted a rule change, a waiver, or an exemption for particular types of operations such as travel clubs, international operations, etc. The EPA has indicated that they do not plan to change the applicability or the schedule for compliance with the JT3D smoke standards. They have rejected requests for a rule change or exemptions based upon such considerations as (1) limited operations that do not represent a large environmental burden, (2) disparity of emissions and noise compliance schedules for an operator, and (3) economic burden and lack of air quality justification. The EPA's stated position on each respective point may be summarized as follows: (1) the operations of each operator of aircraft powered by JT3D engines may contribute little to environmental degradation, but the total environmental burden, that is composed of many such operations, has to be reduced if the nation's air quality goals are to be achieved; (2) the compliance schedule has been delayed twice and no adequate justification has been shown for further changes in the schedule since a schedule based on category of operators or operations would be discriminatory; and (3) the EPA conducted the required economic and air quality analyses when it established the standard and schedule.

Concerning requests for waivers or exemptions, the EPA has indicated that as a policy it does not grant exemptions from the provisions of Federal emissions standards, except under the most extenuating circumstances. The Clean Air Act makes no mention of exemptions in Section 231 pertaining to aircraft emissions. The only provision of this nature in 40 CFR Part 87 appears in Subpart J, which was added to the basic standards in December 1973, (38 FR 35000) to provide a mechanism for operators to request temporary delays in the compliance dates for the fuel venting and JT8D smoke retrofit standards after several foreign airlines experienced difficulty in acquiring and arranging for installation of the necessary replacement parts. The JT3D smoke retrofit program is not presently covered by Subpart J, because the compliance date that was established (and since extended) was set to allow liberal time for development and certification of the necessary replacement parts, and it was not envisioned that any operators would need special delays to meet the compliance schedule. However, should that be the case, the EPA has indicated that it will consider extending the provisions of Subpart J, "Temporary Exemption from Air Emissions Standards," to include the JT3D smoke retrofit program.

For the information of any interested parties, the provisions of Subpart J which are most relevant to potential applicants for temporary EPA exemptions are as follows:

§ 87.101 Application for temporary exemption.

(a) The Administrator of the Environmental Protection Agency may grant to any aircraft or aircraft engine temporary exemption from any applicable standard under § 87.11(a) or § 87.31(a), provided that the owner or operator of such aircraft or aircraft engine demonstrates:

(1) All good faith efforts to achieve compliance with such standards.

(2) Inability to comply with such standard due to circumstances beyond his control, and

(3) A plan by which he will achieve such compliance in the shortest time which is feasible.

(b) Applications for temporary exemption from the requirements of § 87.31(a) shall be submitted in duplicate to the Administrator of the Environmental Protection Agency and shall contain the following information:

(1) The name and address of the applicant,

(2) The standard or requirement from which temporary exemption is requested,

(3) The number of aircraft or aircraft engines subject to the requirement for which a temporary exemption is requested,

(4) The efforts made by the applicant to accomplish compliance, including ordering of equipment and scheduling of maintenance work, and the dates of these efforts,

(5) A detailed statement of reasons why the applicant will not be in compliance when the standard or requirement becomes effective,

(6) The name of the equipment supplier and/or the name of the firm retained to perform the maintenance work,

(7) The applicant's proposed timetable for installation of equipment and obtaining necessary approvals for each aircraft or aircraft engine for which temporary exemption is requested, and

(8) The name of the person responsible for accomplishing compliance according to the timetable proposed by the applicant.

(c) Prior to taking action on an application for temporary exemption, the Administrator shall consult with the Secretary of Transportation. A copy of the applicant's request should be submitted by the applicant to the Secretary of Transportation.

(d) The Administrator shall publish in the *Federal Register* the name of the owner or operator to whom a temporary exemption is granted and the period of such exemption.

(e) No state or political subdivision thereof may attempt to enforce a standard respecting fuel venting or smoke emissions from an aircraft or engine if such aircraft or engine has been granted an exemption from such standard."

December 15, 1976, was the effective date for the EPA rulemaking that first extended the compliance date for smoke standards applicable to JT3D engines. The extension was predicated on EPA's determination that a means of achieving compliance had been developed, was completing service evaluation, and would be available for installation beginning in the spring of 1978. Since those operators contemplating operation of JT3D-powered airplanes after 1980 have been given adequate time to order retrofit kits (and any required tooling) or new combustors, the EPA has indicated that it will not consider favorably requests for temporary delays in compliance that do not demonstrate that a conscientious effort was made to comply with the requirements. Purchasers of noncomplying aircraft subsequent to December 15, 1976, should not expect special considerations by the EPA simply because they were ignorant of the legal emissions requirements.

As provided in § 9 of SFAR 27, should the EPA act through rule or interpretations to modify the compliance requirements, these actions would be reflected in FAA's enforcement activities, as appropriate.

DISCUSSION OF COMMENTS AND THE RULES

The following is a discussion of pertinent portions of the proposal to SFAR 27 (Notice No. 80-6) and any comments related to the subject matter covered.

Local Regulations

Commenters representing international air carriers expressed concern that some U.S. airports might attempt to apply more stringent regulations than those imposed by the Federal Government. That concern is unfounded. Section 233 of the Clean Air Act effectively prohibits such action as it states that no State or political subdivision may adopt or attempt to enforce any standard concerning emissions of air pollutants from any aircraft or aircraft engine unless that standard is identical to the Federal standards.

Operational Engines

Though the term "operational engines" is not defined in 40 CFR Part 87, the previous quote from § 87.31(c) indicates that operational Class T3 engines are a subset of the in-use aircraft gas turbine engines of Class T3. (The term "in-use aircraft gas turbine engine" is defined in Part 87 as an aircraft gas turbine which is in service.) For purposes of enforcement, "operational Class T3 engines" include only those engines installed on airplanes that operate in the United States. Therefore, spare engines will not be monitored, though they will have to come into compliance at about the same rate as operational engines in order to keep an operator's airplane fleet in compliance when complying operational engines need to be removed. The EPA has indicated that this enforcement approach is consistent with 40 CFR Part 87.

Replacment Airplanes

The EPA has defined the term "replacement engines" in § 87.31(c) where the term "replacement airplane" was introduced, but did not define the latter term because the EPA assumed that an analogous definition was implied. For purposes of enforcement, a "replacement airplane" is an airplane powered by engines, other than Class T3, that meets applicable smoke emission requirements. The EPA has indicated that this approach is consistent with 40 CFR Part 87, as interpreted by the EPA.

Achieving Compliance

Pratt and Whitney (P&W) Service Bulletin No. 4694 describes the methods and parts for modification of in-use JT3D engines to provide a burner configuration that results in smoke density levels consistent with the EPA maximum limit. One commenter noted "unsatisfactory results" from such a burner configuration, but the commenter did not provide any information to support that assertion. The burner retrofit configuration in the referenced Service Bulletin (also described in the FAA-approved Engineering Change 284890) has been installed in a JT3D-7 engine and shown to produce maximum smoke numbers well below the standard of 25 during separate test runs. In addition, the approved modification has undergone several thousand cycles of engine testing, several airline tests, and more than 150,000 hours of service tests. Another comment stated that "the burner modifications necessary to reduce smoke emissions are believed to have been sufficiently service tested for performance and durability." The FAA agrees. Based on these tests, the burner retrofit configuration described in Service Bulletin 4694 is considered to be in conformance with the EPA standards. The EPA, therefore, regards modification of a JT3D engine in accordance with the above Service Bulletin to be satisfactory evidence of compliance with 40 CFR Part 87, if that engine is properly maintained.

Thus, in a fashion similar to that used previously in SFAR 27 to ensure compliance by in-use JT8D engines, this amendment incorporates by reference the P&W Service Bulletin No. 4694 in § 14 of the SFAR. The Service Bulletin is available for examination in the FAA Rules Docket, AGC-204, Room 916, 800 Independence Avenue, S.W., Washington, D.C. 20591, or may be obtained from Pratt and Whitney Aircraft Division of United Technologies Corporation, 400 Main Street, East Hartford, Connecticut 06108. In addition, to ensure that the incorporated materials are reasonably available to interested persons, it will also be available at the locations listed in the new § 10(e). The incorporation by reference has been approved by the Director of the Federal Register pursuant to 5 U.S.C. 552(a) and 1 CFR Part 51. It should be noted that those incorporated documents describe merely one acceptable means of compliance for an in-use JT3D engine to achieve the EPA smoke standards. Any other means, consistent with § 11 of the SFAR, that is demonstrated by the prescribed test procedures of EPA's Part 87 to limit engine emissions below smoke number 25 will be accepted as compliance with the provisions of § 87.31(c) that are incorporated in this amendment to SFAR 27.

P&W Service Bulletin 2417, which was incorporated by reference in SFAR 27, has been cancelled by Pratt and Whitney and has been incorporated in parts catalogs. Since retrofit in accordance with P&W Service Bulletin 2531 is sufficient to meet JT8D smoke requirements without reference to Service Bulletin 2417 or Engineering Change 197707 (which provide the details needed for conducting a service evaluation of the smoke reduction chamber configuration for JT8D engines), the incorporation by reference to P&W Service Bulletin 2417 and P&W Engineering Change 197707 is no longer needed, and has been deleted from SFAR 27.

Airplanes and Engines Covered by Replacement Plans

JT3D engines or JT3D-powered airplanes that are scheduled to be replaced with complying engines or airplanes before 1985 may continue to be operated after the 1981 and 1983 interim dates in the phased compliance schedule, if those engines or airplanes are covered by an FAA-approved replacement plan (§ 87.31(c)). Thus, an operator may elect to submit to the FAA for approval a plan under which replacement engines (engines of a class different than Class T3 that have been shown to meet EPA smoke emission requirements) or replacement airplanes (airplanes powered by engines of a class different than Class T3 engines that meet applicable EPA smoke emission requirements) have been ordered and are scheduled for delivery prior to January 1, 1985. If the plan is approved, those engines and airplanes included in the plan do not have to comply with the phased compliance schedule for Class T3 engines until January 1, 1985, or an earlier date specified in the plan. Those approved replacement plans may constitute a compliance strategy for smoke emissions even if a replacement plan is not needed for the FAA's operating noise limits rule. The noise rule does not require compliance before 1985 for Part 91 and 123 operations and for airplanes engaged in foreign air commerce in the United States under an approved method of apportionment. Thus, some operators may wish to request approval of a replacement plan for smoke emission compliance purposes only. Replacement plans for noise that are submitted by operators under 14 CFR 91.306 which have FAA approval may, upon request, serve as FAA-approved plans for the EPA smoke emissions standards as well.

Under this amendment, any replacement plan submitted solely for smoke emissions purposes should be submitted to FAA's Office of Environment and Energy and should, at a minimum, include (1) the operator's name and address, (2) the name, title, address and phone number of the person who submitted the plan, (3) the operator's current and projected inventory of JT3D engines (by serial number) and JT3D-powered airplanes (by aircraft registration number and airplane serial number) covered by this SFAR, (4) the verifiable order and schedule for replacement of those engines or airplanes, and (5) certification that the plan is true and complete (under penalty of 18 U.S.C. 1001). If a replacement plan strategy is selected, the plan should be submitted to the FAA by December 1, 1980, to provide sufficient time for the FAA approval process to be completed prior to the first interim compliance date, January 1, 1981. Later submissions might not be approved before compliance is required, and will not be a basis for relief from compliance with the rule without EPA remedial action.

The approval process for replacement plans includes consideration of whether the plan would provide benefits similar to the emissions reduction that would be achieved through a phased retrofit program without replacement. Thus, a plan submitted by an operator with a large JT3D-powered fleet may be unacceptable if it delays replacement of a substantial portion of its fleet until December 1984, and does not provide a compelling reason for such an inordinate delay. In considering approval of specific replacement plans for emissions submitted by those operators required to prepare compliance plans for noise (under 14 CFR 91.308) the approval process of replacement plans for emissions will include a comparison between plans for consistency and differences. While some minor differences might be expected since the objectives are not the same, each operator's fleet projections and compliance strategy should be traceable among any different plans the operator submits. Any unplanned changes in an operator's equipment inventory or plans for replacement of aircraft or engines covered by this SFAR will necessitate an update in the replacement plan.

Several commenters said that even though most operators will be replacing their JT3D-powered aircraft, their filing or replacement plans would place an unnecessary administrative burden on the FAA. These commenters would prefer an exemption or waiver. This option was discussed earlier and it was indicated that FAA has no authority to grant exemptions or waivers from the EPA standards (see § 9(a) of SFAR 27). Since EPA has given operators the option of submitting replacement plans, FAA will provide the necessary review of these plans.

Replacement Credit

"Replacement credit" permits the operator of an airplane (or engine) covered by an FAA-approved replacement plan to continue to operate that airplane (or engine) until 1985 or an earlier date specified in the plan. For compliance purposes, each airplane or engine scheduled for replacement in an FAA-approved plan will be counted as if it were in compliance and any airplane or engine that has been replaced by each interim compliance date will be counted in the fleet count for that date.

Retirement Credit

On December 15, 1976, the EPA announced (43 FR 54861) that compliance with its smoke emissions standards for Class T3 engines was technically achievable. One of the options available to operators at that time was retirement of aircraft on which Class T3 engines were installed (an option still available). The retirement option was not addressed in the preamble to the proposal. Since "retirement credit" is applicable under the FAA's operating noise rule and achieves the air quality goals of EPA, the concept of retirement credit has been accepted by the EPA as a compliance strategy consistent with Part 87. Permitting the use of this concept increases the consistency between compliance with the Part 91 noise requirements and the SFAR emissions requirements. Retirement credit permits the operators of airplanes covered by 40 CFR 87.31(c) to count the associated Class T3 operational engines as complying engines if those airplanes are retired from any future operation in the United States without replacement after December 15, 1976. This is similar to the procedures that operators are allowed to follow in fulfilling the requirements of 14 CFR 91.305, though the earliest date for emissions and noise retirement credit are different (December 15, 1976 vice January 1, 1977). Retirement credits only apply to engines installed on airplanes that are retired; spare engines are not eligible for such credit. The credit is not available until shown to be a true and complete retirement from U.S. service without replacement. If an airplane or engine for which retirement credit has been given is replaced or operated in the United States even by another operator, the credit is, of course, forfeited.

Operators electing to take retirement credit should certify (under penalty of 18 U.S.C. 1001) the following information in writing to the FAA's Director of Environment and Energy before December 1, 1980 for 1981 compliance, and December 1, 1982 for 1983 compliance purposes: (1) the operator's name and address, (2) the name, title, address and phone number of the person submitting the information, (3) the date of the submission, (4) a statement that the operator is eligible for "retirement credit" in meeting compliance on the interim dates, (5) the operator's inventory of JT3D-powered airplanes and engines covered by this SFAR (by aircraft registration number, airplane serial number, and engine serial number) with an indication of those airplanes that have been retired after December 15, 1976, including the date when each listed airplane was retired from service in the United States without replacement.

Compliance Schedule (Interim Compliance Dates)

The EPA has indicated that the proportions prescribed by 40 CFR 87.31(c) for interim compliance dates apply to the operational engines and not the individual JT3D-powered airplanes. Specifically, unless an operator has FAA approval for a replacement plan or has elected to use retirement credit before the date specified in the previous discussion, the proportions apply to the total number of operational engines owned or controlled by each operator on, and after, each interim compliance date. If replacement or retirement credit is selected by an operator, these factors are considered in calculating the proportions on the interim compliance date.

In general, each proportion is the quotient of the number of "complying operational engines" divided by the total number of operational engines" in the operator's fleet. The number of "complying operational engines" is (the sum of) the number of any operational Class T3 engines that meet the EPA smoke emissions standard, plus the number of any Class T3 engines installed on aircraft that were retired completely from U.S. service without replacement between December 15, 1976 and the interim date, plus the number of any operational engines of Class T3 by an FAA-approved replacement plan. The "total number of operational engines" in the fleet is (the sum of) the number of all operational engines owned or controlled on the interim compliance date, plus the number of any Class T3 engines installed on aircraft retired completely from U.S. service without replacement between December 15, 1976 and the interim date, plus the number of any engines of Class T3 covered by an FAA-approved replacement plan that have been replaced by the interim date.

Comments were received from operators which have no interim noise compliance dates and object to interim compliance dates for smoke emissions. One aspect of their objection was the likelihood that aircraft would be retired or replaced by 1985 to meet the FAA noise rule, making engine modifications for earlier emissions compliance dates an uneconomic alternative. The EPA has considered the argument and, as indicated earlier, considers it discriminatory to establish a different set of compliance dates for different classes of operators. Another aspect of that concern is summarized in the comment from the International Air Transport Association which said:

> "There are significant real difficulties which are equally applicable to the intermediate partial compliance requirements of 40 CFR 87. We understand that, in computing the number of engines required to be modified, reference would probably be made by the FAA to the Operations Specifications of the airline in question. In deciding which aircraft to list in its Operations Specifications the airline could list the registration numbers of just the number of aircraft of the type(s) it operates in U.S. service theoretically needed to support these services. This would minimize the number of engines required to be modified but could restrict the ability of the airline to obtain maximum utilization of the whole fleet of the type(s) concerned. Alternatively, the airline could reduce this constraint by listing the registration numbers of more than this theoretical minimum number of aircraft (up to the whole of its fleet of the type(s) concerned), but clearly this would increase the number of engines required to be modified. Moreover, it would be unreasonable to expect an airline to modify more engines than required for service to the U.S. when no other country requires a similar modification."

The above comment correctly assumes that aircraft listed on an operations specification will be considered to represent those aircraft that a foreign operator has determined to be those operating in the United States (without regard to the frequency of operations). Whether the operator chooses to minimize the number of airplanes operated into the United States or to increase operational flexibility by designating more airplanes for U.S. operations is a matter best reserved to the operator. Balancing these factors should be a prerogative of the operator and should not be dictated by the rule. Those who have listed more than the minimum number of aircraft (which is a typical approach) may be eligible for retirement credit for those aircraft removed without replacement from any future U.S. service.

As indicated in SFAR 27 § 9(a), and as discussed earlier, the FAA cannot grant variances from the prescribed schedule established by the EPA. All comments on that schedule have been referred to the EPA for consideration. Operators are reminded that they should take the necessary actions to meet the phased compliance schedule. Several comments mentioned lack of availability of retrofit kits, lack of tooling, and lack of personnel to perform the modifications. EPA has indicated that such conditions might be the basis for a request to the EPA for a temporary delay in compliance, if the operator can demonstrate that good faith attempts have been made since December 15, 1976, to order retrofit kits and tooling and to obtain maintenance personnel (or a maintenance organization) to perform the retrofitting of engines and that such attempts have been unsuccessful. (See 40 CFR 87.101).

Pratt and Whitney Aircraft indicated on July 3, 1980, that it originally planned to produce sets of retrofit parts sufficient for 1000 engines, However, they decided to limit their production run to 100 sets due to a lack of orders. As of that date they had orders for 93 sets (mostly from one operator) with seven sets still available. The lead time for additional sets of parts is sixteen months. They have had no orders for tooling and did not believe that any operator or maintenance shop has developed the tooling capability. The lead time for tooling from P&W is about one year, although maintenance shops can fabricate their own tooling sooner. From those indications, no serious attempt has been made by any operator to achieve compliance through the retrofit option.

Some comments indicated that it will be extremely difficult, if not impossible, for the FAA to determine the degree of compliance, particularly by foreign operators. The FAA does not agree. Its monitoring program will include field examinations and review of documentation such as operations specifications, airplane flight manuals, noise compliance plans, etc. The compliance plan is the only document that is not applicable to foreign operators. The FAA program should be sufficient for the purposes of ensuring that operators meet the compliance schedule. If, based on experience, additional means are found to be necessary, the FAA will move promptly to develop and implement additional mechanisms to ensure compliance.

Certification and Engine Approval Actions

Sections 15, 17, 19, and 21 of SFAR 27 have been revised to reflect the EPA requirements applicable to in-use JT3D engines. Those revisions are unchanged from the proposed amendment. No commenter addressed the issues presented.

Since the EPA amendment to § 87.31(c) concerning in-use JT3D engines affects the continued operation of airplanes powered by JT3D engines, it raised questions concerning the need and the appropriateness of including references to in-use JT3D engines in the certificate actions covered by §§ 15, 17, and 21 and the approval actions in § 19. After reviewing these current provisions in light of the EPA amendment, it would be misleading to issue certificates or make approvals after the final compliance date for engines that cannot legally be operated in the United States. This amendment is consistent with the treatment given Class T2 and T4 engines and T3 engines manufactured on and after January 1, 1978. However, operation of non-complying, in-use JT3D engines manufactured before January 1, 1978, is not completely prohibited until January 1, 1985. The EPA's 1981 and 1983 interim compliance dates for in-use JT3D engines do not apply to certificate and approval actions for JT3D engines manufactured before January 1, 1978. Thus, if the FAA set any cutoff date for certifications and approvals prior to January 1, 1985, (the final compliance date in EPA's Part 87 that applies to all JT3D engines) would be more stringent than the EPA rule. This amendment uses that date as the cutoff date for further certificate and approval action, regardless of the date of application.

As each Class T3 engine is modified to meet the smoke emissions standards, the model designator on the engine identification plate must be modified in accordance with P&W Service Bulletin 4694 in order to comply with § 19(b) of SFAR 27.

Operation

Section 25 has been amended to reflect EPA's Part 87 phased compliance schedule for in-use JT3D-powered airplanes operated in the United States. Comments recommending that FAA delete the interim compliance dates cannot be acted upon. As discussed earlier, such a change is outside the scope of FAA's authority.

Codification

The proposal indicated that consideration is being given to codifying permanently the FAA airplane emissions regulations (SFAR 27) under Title 14 of the Code of Federal Regulations (CFR). There are several options being considered, including (1) redistributing the provisions of SFAR 27 among the various parts of the code as appropriate, e.g., Part 21, Part 33, Part 45, Part 91, etc., and (2) continuing to provide a single code unit for engine emissions by establishing a new Part in Title 14, e.g., Part 34, with references to other affected parts. Three commenters supported the desirability of permanent codification and none opposed such action. One commenter suggested that Part 33 "Airworthiness Standards: aircraft engines" be amended to include the provisions of SFAR 27. The other commenters suggested permanent codification in a single separate unit. (One suggested numbering it Part 34.) The FAA is continuing its review of the issues before taking action to modify the form (not substance) of the regulation.

ADOPTION OF THE AMENDMENT

Accordingly, 14 CFR Chapter I, Special Federal Aviation Regulation (SFAR) 27 is amended, effective December 1, 1980.

(Sec. 232, Clean Air Act, as amended December 31, 1970, PL. 91-604 (42 U.S.C. § 1875f-10) as delegated (36 FR 3733); 40 CFR Part 87; Secs. 307(c), 313(a), 601, and 603, Federal Aviation Act of 1958 (49 U.S.C. §§ 1348(c), 1345(a), 1421, and 1423; Sec. 6c, Department of Transportation Act (49 U.S.C. § 1655(c).)

NOTE.—The FAA has determined that this document involves a regulation which is not significant under Executive Order 12044 as implemented by DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). A copy of the evaluation prepared for this action is contained in the regulatory docket. A copy of it may be obtained by contacting the first person identified above under the caption "FOR FURTHER INFORMATION CONTACT."

NOTE.—The incorporations by reference contained in this amendment were approved by the Director of the Federal Register under 5 U.S.C. § 552(a) and 1 CFR Part 51 on August 18, 1980.

Special Federal Aviation Regulation 27-5

Fuel Venting and Exhaust Emission Requirements For Turbine Engine Powered Airplanes: Compliance with Revised EPA Emission Standards and Test Procedures

Adopted: December 8, 1983 Effective: January 1, 1984

(Published in 48 FR 56735, December 23, 1983)

SUMMARY: This amendment to the FAA airplane emissions rule is necessary because of the revised requirements of 40 CFR Part 87, Control of Air Pollution from Aircraft and Aircraft Engines; Emission Standards and Test Procedures as amended effective January 31, 1983 (47 FR 58462). 40 CFR Part 87 includes new exhaust emission requirements for all aircraft engines manufactured on or after January 1, 1984. This amendment is in accordance with section 232 of the Clean Air Act, as amended, (42 USC § 7401) and the authority delegated to the Administrator of the FAA by the Secretary of Transportation.

COMPLIANCE—January 1, 1984 or as noted. The Director of the FEDERAL REGISTER approved the incorporation by reference of the compliance procedures set forth in Appendices 2 through 6 of ICAO ANNEX 16 Volume II—Aircraft Engine Emissions, dated February 18, 1982, effective January 1, 1984.

FOR FURTHER INFORMATION CONTACT:

Nicholas P. Krull, Air Quality Division (AEE-300), Office of Environment and Energy, Federal Aviation Administration, 800 Independence Avenue, SW, Washington, D.C. 20591, telephone (202) 755-1851).

SUPPLEMENTARY INFORMATION:

HISTORY

Under section 232 of the Clean Air Act of 1970, as amended, (the Act) (42 USC § 7401), the FAA has a duty to issue regulations that ensure compliance with all aircraft emission standards promulgated by the EPA pursuant to section 231 of the Act. The EPA aircraft emission standards are currently prescribed in EPA Regulations Part 87 (40 CFR Part 87), originally issued on July 6, 1973, and published in the Federal Register (38 FR 19088) on July 17, 1973.

Pursuant to § 232 of the Act, on December 26, 1973, the FAA issued Special Federal Aviation Regulation (SFAR) 27 (38 FR 35487; December 28, 1973). The purpose of SFAR 27 was to ensure compliance with aircraft and aircraft engine emission standards and test procedures issued by the EPA in 40 CFR Part 87.

SFAR 27, as originally issued, governed compliance with only those standards and procedures in EPA Part 87 that were to become effective on February 1, 1974. On December 23, 1974, the FAA issued SFAR 27-1 (39 FR 45008; December 30, 1974) to require compliance with the fuel venting emission standards in EPA Part 87 that became effective on January 1, 1975. SFAR 27-2, effective January 1, 1976 (40 FR 55311; November 28, 1975), governs compliance with smoke emissions standards in EPA's Part 87 applicable to new and in-use aircraft turbofan or turbojet engines with a rated power of 29,000 pounds thrust or greater, that are designed for installation and operation on subsonic airplanes. SFAR 27-3, effective January 1, 1978 (42 FR 64876; December 29, 1977) regulates compliance of JT3D engines manufactured on and after January 1, 1978, with smoke emissions standards in EPA's Part 87. Finally, SFAR 27-4, effective December 1, 1980 (45 FR 71960; October 30 1980), was issued to require phased compliance of in-use JT3D engines beginning on January 1, 1981, with total compliance required by January 1, 1985. Pursuant to § 3(b) of SFAR 27, the requirement for compliance of in-use JT3D engines was automatically deleted when the EPA deleted the requirement from 40 CFR Part 87 (48 FR 2716; January 20, 1983).

On December 30, 1982, the EPA completed rulemaking which revised 40 CFR Part 87 and republished the rule in its entirety (47 FR 58462; December 30, 1982). The revised rule contains a number of changes in definitions as well as new standards for smoke and unburned hydrocarbon emissions. The compliance date for the new smoke and unburned hydrocarbon emission standards has been scheduled to take effect January 1, 1984. On September 23, 1983, the FAA issued Notice No. 83-12 (48 FR 43637; September 23, 1983), which proposed a revised SFAR 27-5 to include the new requirements of 40 CFR Part 87. The comment period closed on October 24, 1983. A number of comments were received and they are discussed below along with the discussion of the amendment.

DISCUSSION OF THE AMENDMENT

Overview

When the EPA originally issued 40 CFR Part 87, in 1973, it was recognized that some portion of the standards could be implemented in a very short time period while other portions would require a much longer time period for development and testing. Accordingly, the FAA proceeded to promulgate enforcement regulations for the near term requirements in the form of a Special Federal Aviation Regulation, SFAR No. 27. Since that time, the EPA has recognized that some of the longer term requirements were either unneeded or practically unattainable. Those longer term requirements, originally scheduled to become effective in 1978, have been delayed until January 1, 1984, and have been extensively revised. Revised regulation 40 CFR Part 87 now contains all of the standards and the last of the effectivity dates for implementation. Pursuant to section 232 of the Clean Air Act, as amended, the FAA is required to promulgate enforcement regulations for all of the standards in 40 CFR Part 87. Therefore, this amendment is consistent with the EPA revisions to 40 CFR Part 87 and FAA's statutory duty under the Clean Air Act.

Deletion of specific reference to previous findings of compliance

SFAR 27 contained specific references to manufacturer's service bulletins containing instructions for modifications which, if incorporated in engines, constituted satisfactory evidence of compliance with 40 CFR Part 87. The references also included engine mode designations which had previously been found to comply with the smoke standards of 4(CFR Part 87. That list had become long and required frequent updating as new engine models were found to demonstrate compliance with the standards. As revised, 40 CFR Part 87 contains new and in some cases more stringent standards for all turbojet and turboprop engines manufactured after January 1, 1984. The listing of all of these model designations would become cumbersome and impractical requiring frequent revision of the Federal Aviation Regulations. The FAA now deletes those specific references and instead, SFAR 27-5 states that "All methods of demonstrating compliance and all model designations previously having been found acceptable to the Administrator of the FAA shall be deemed to continue to be an acceptable demonstration of compliance with the specific standards for which they were approved."

Practical interpretation of the requirement for total compliance

The standards established by the EPA are applicable to each engine of the types and upon the dates specified in 40 CFR Part 87. Taken literally this would require that every engine to which the standards apply must demonstrate compliance with the standards. This construction would require testing each and every engine manufactured on or after January 1, 1984, unless specifically exempted. The EPA recognized in the preamble to 40 CFR Part 87, and specifically in § 87.89, that exhaust emission compliance testing of every engine would be excessively costly and accepted the need to substitute a preproduction certification program in place of extensive testing of all newly produced and in service engines. Section 87.89 has delegated the definition of this substitute certification program to the FAA with the proviso that the FAA establish the level of confidence required, provide a practical interpretation of the requirement for total compliance, establish a testing program to ensure compliance, and obtain the approval of the Administrator of the EPA prior to January 1, 1984. Consistent with EPA's position regarding compliance verification (47 FR 58469), the FAA understands that this compliance verification policy is applicable to all of the standards in 40 CFR Part 87. It should be clearly understood that any substitute certification program must have the concurrence of the Administrator of the EPA.

In developing the United States position on the International Civil Aviation Organization (ICAO) Standards and Recommended Practices for Aircraft Engine Emissions, the FAA consulted extensively with the EPA on acceptable practical interpretations of a requirement for total compliance and a testing program to ensure compliance. At that time the EPA indicated that the minimum acceptable levels would be 90% confidence that 95% of the engines would meet the gaseous emission standards and a 90% confidence that every engine would meet the smoke standards. ICAO adopted such a compliance procedure based upon a composite analysis of historic engine to engine variabilities. Since the EPA has stressed the desirability of maintaining commonality with ICAO, the FAA adopts the compliance procedure defined in Appendix 6 to ICAO Annex 16 Volume II—Aircraft Engine Emissions, dated February 18, 1982. The Administrator of the EPA has concurred in FAA adoption of the ICAO compliance procedure. The FAA continues to solicit recommendations for equivalent procedures and will give each recommendation full consideration if it is accompanied by substantive supporting data. Should an equivalent or better procedure be received, the FAA will seek EPA concurrence with that as an alternate compliance procedure. The FAA cannot, however, adopt any proposed compliance procedure unless it has the concurrence of the Administrator of the EPA.

Comments in response to Notice 83-12

A total of seven written and three oral comments were received in response to Notice 83-12. The majority of those comments concerned the alleged redundancy of the regulation, the marking and identification requirements, and the exemption and reporting procedures. At least two comments indicated some continuing confusion over the definition of the term "date of manufacture". All of the comments have been reviewed and, as discussed below, the proposed rule has been revised to reflect meritorious comments and suggestions within the scope of Notice 83-12.

Redundancy of the proposed compliance requirements

One commenter noted that the proposed rule imposes compliance requirements upon the engine manufacturer, installers of engines, aircraft manufacturers, and airplane operators. The commenter felt that compliance need only be the responsibility of the engine manufacturer. From a legal viewpoint, the Clean Air Act requires that the regulations "shall include provisions making such standards applicable in the issuance, amendment, modification, suspension, or revocation of *any* certificate authorized by the Federal Aviation Act or the Department of Transportation Act." (42 USC 7572(a), *emphasis added*). From a practical and legal viewpoint, the engine manufacturer can only maintain control over the engines while they are in his possession. Yet, situations may arise where compliance may subsequently be required. For example, an engine originally manufactured and sold for export may be exempt from the standards but that same engine may not be exempt if it is resold for use in the United States as a civil aircraft engine. In that event, it would no longer be the manufacturer's responsibility to ensure compliance but rather the operator or the new owner. Similarly, an engine originally sold by a manufacturer for use in general aviation is not subject to the unburned hydrocarbon standard. However, that standard is applicable if the rated output exceeds 26.7 kilonewtons and the engine is installed and operated in the U.S. by an air carrier or a commercial operator. For these and other reasons, it is necessary to impose compliance requirements upon airplane operators, mechanics, and aircraft manufacturers, as well as the engine manufacturer. It also explains the justification for requiring that the engine exhaust emission compliance status be clearly and permanently identified in a prominent location on each powerplant.

Exemption Requirements

As stated in Notice 83-12, the EPA has retained primary rulemaking authority over the emissions standards, and the test procedures for control of those standards, in all aircraft. However, under the revised Part 87, responsibility for initial evaluation and processing of requests for certain specified exemptions has been transferred to the Secretary of the Department of Transportation (DOT). Several exemptions listed at 40 CFR § 87.7 clearly fall within the discretion of the FAA and EPA and therefore can only be considered by utilizing the procedural requirements of 14 CFR Part 11. These exemptions include 40 CFR § 87.7(a) (4), § 87.7(c), and § 87.7(d). However, several commenters have asked if it was the FAA's intent to require a formal exemption request for the remainder of the exemptions listed under 40 CFR § 87.7. To make the requirements clear, each of the remaining exemptions will be discussed in turn.

40 CFR § 87.7(a) (1) establishes an exemption for engines installed on an aircraft intended for export. The FAA has an obligation to ensure that exported engines not in compliance with the emission requirements are not operated in the United States. With this objective in mind, the FAA has determined that the marking and recording requirements discussed below, together with the existing Part 21, Subpart L requirements for Export Airworthiness Approvals, will ensure that exported engines cannot be returned for use in the United States without emission modification to bring them into compliance with SFAR 27. Accordingly, the final rule has been amended to require that any engine manufactured under the provisions of 40 CFR § 87.7(a) (1) for export on or after January 1, 1984, must have marked upon the engine manufacturer's identification plate (I.D. plate) the designator NON-US. In addition, the permanent powerplant record (engine logbook or equivalent document) must note that the exempt engine is not suitable for operation within the United States. Finally, when the exempt engine is installed in an aircraft, the aircraft's logbook must note that the aircraft "may not be operated within the United States." This notation may be removed if the engine is later modified to comply with 40 CFR Part 87, or becomes specifically exempted from the applicable emission requirements. These changes are necessary to avoid requiring engine manufacturers to obtain a formal exemption or report the serial number of engines intended for export. The later requirement would be duplicative and unnecessary in light of current regulation and policy.

40 CFR § 87.7(a) (2) permits non complying engines to be flown for short durations to a base where maintenance can be performed, to a point of storage, of for the purpose of returning an aircraft to service. Since § 87.7(a) (2) in effect establishes an applicability criteria for Part 87, the FAA does not feel that the procedural requirements of 14 CFR Part 11 must be followed in order to legally conduct this type of operation. Instead of requiring an operator to "petition" for a nondiscretionary exemption, the FAA recognizes a need for prior notification of intent to conduct such operations. Therefore, though the procedural requirements of 14 CFR Part 11 need not be followed, prior FAA authorization is required. Since the FAA views this type of operation as analogous to those requiring a special flight permit, to obtain such authorization, the operator should follow the procedures outlines in 14 CFR § 21.199.

40 CFR § 87.7(a) (3) allows for flights of short duration at infrequent intervals if conducted as part of an official visit by representatives of foreign governments. After careful consideration, the FAA has determined that the infrequency of these types of operations does not warrant prior FAA approval of any sort. Therefore, no additional FAA approval is necessary if the flight is indeed of limited duration and is conducted exclusively for the purpose of an official foreign visit.

40 CFR § 87.7(b) provides for an exemption for engines operated in the United States when certain low production limits are maintained. The FAA has an obligation to ensure that the low production limits of 40 CFR § 87.7(b) are not exceeded. The only adequate method to ensure compliance with the low production limits is to require a formal exemption request. Consequently, each time a manufacturer intends to use or sell a non complying engine in the United States, a request for exemption utilizing the procedural requirements of 14 CFR Part 11 must be made. To implement this procedure, a manufacturer should request an exemption for any group of 20 or less engines that a manufacturer intends to produce under a given type certificate during a given calendar year. Assuming that there are no irregularities, the FAA will grant the exemption on condition that the manufacturer advise the FAA of that engine's serial number and type certificate number on or before the last day of the month following the date of its manufacture. In addition, as will be explained later, that engine must be labelled as EXEMPT at FAA Headquarters which will contain the serial number of the engine as part of each exemption. At the same time, the manufacturer must note in the permanent powerplant record that the engine is not required to meet the emissions standards of 40 CFR Part 87 by reason of the low production exemption. In a related issue, several commenters have stated that it is impossible to project the market for specified engines in advance of the manufacture date and therefore it is unreasonable to require manufacturers to advise the FAA of exempted engines "on or before the date of manufacture" as proposed in Section 9(c). The FAA agrees with these commenters and has revised the final rule to provide relief in several ways. First, as adopted, the final rule requires that a manufacturer advise the FAA of the serial numbers of only those engines which have been granted a specific exemption pursuant to 14 CFR Part 11. In addition, the manufacturer may wait until the last day of the month following the date of the engine's manufacture to provide the FAA with this information.

Date of Manufacture

Although the identical definition has been part of SFAR-27 for some time, several comments were received which indicate that the term "Date of Manufacture", was misunderstood or subject to misinterpretation. One commenter expressed a desire to interpret "date of manufacture" as the date of installation on an airplane or even the date of sale of that aircraft. A second commenter expressed concern that engines in transport from the engine manufacturer to an airframe manufacturer (or in inventory at a general aviation facility) on January 1, 1984, would be subject to the revised 40 CFR Part 87 requirements. Both interpretations are too broad. The meaning of the term "Date of Manufacture" was extensively discussed in the preamble to SFAR 27-3 adopted December 21, 1977, and remains unchanged. However, to further clarify, the date on which an engine is "manufactured" is the date on which the engine is originally approved by the FAA. An engine is considered to be approved by the FAA when it is produced under an FAA Production Certificate issued under the provisions of 14 CFR Part 21, Subpart G, or under a Type Certificate Only issued under the provisions of 14 CFR Part 21, Subpart F. In addition, the engine must have been determined by the manufacturer to be in conformity with its type design and in a condition for safe operation in accordance with 14 CFR § 21.165 or § 21.130 as appropriate. Evidence of this approval is the manufacturer's fire proof identification (I.D.) plate that must be affixed to the engine in accordance with 14 CFR § 45.11 and § 45.13. In the case of a foreign manufactured engine, the "date of manufacture" is the date when the certificating authority of the country of manufacture issues a certifying statement to the effect that the engine conforms to its U.S. type design and is in a condition for safe operation.

Notice 83-12 proposed that the date of manufacture be included on the I.D. plate as part of the engine identification data. Several commenters have alleged that this requirement is redundant since the same information must be included as part of the permanent powerplant record that accompanies the engine, and because the date of manufacture is directly traceable to the engine serial number. Obviously, knowledge of the date of manufacture is essential to the FAA inspector who must determine whether the revised requirements of 40 CFR Part 87 are applicable to the engine. For an engine with a long maintenance history, specific items of information may be difficult and time consuming to locate. In addition, since there is currently no requirement that serial numbers be reported to the FAA, no master list exists for an inspector to consult. In any event, an inspector should not be required to examine additional records to determine if a particular engine must comply with revised 40 CFR Part 87. It is therefore, the FAA's position that the only efficient method of determining whether a particular engine falls within the requirements of 40 CFR Part 87 is to have the date of manufacture indicated on the I.D. plate of each particular engine. The FAA also wishes to make clear that only those engines manufactured on or after January 1, 1984, covered by the applicable provisions of 40 CFR Part 87 will be required to include the date of manufacture as part of the identification data of the engine I.D. plate. This can be done simply by indicating the month and year in a clear and concise fashion. As an example, the FAA suggests a designation such as "01-84" be marked on the I.D. plate to indicate a manufacturing date of January, 1984, as a means of complying with the "date of manufacture" requirement. The FAA is aware of several manufacturers who already routinely include this information on the engine I.D. plate. Therefore, it should not be unduly burdensome to now require this information.

Another comment regarding the date of manufacture requirement was that such a date may be confusing and misleading to potential buyers of used engines. The commenter asserted that, as an example, a 15 year old engine may have had substantial service and parts replacement by the year 1999, leaving only the I.D. plate of 1984 vintage. However, this same commenter admitted that the date of manufacture, as well as data on major maintenance actions, parts replacement, and service bulletin compliance, is already included in the engine logbook which is required for each engine. Therefore, potential buyers of the engine should not be confused as to the engine's serviceability. Rather, the date of manufacture should help to clarify what maintenance and parts are required to keep in compliance with SFAR-27.

Identification Data and Recording Requirements

In addition to the date of manufacture, proposed Section 20 of Notice 83-12 require that the I.D. plate show a designation that indicates the status of compliance with th applicable provisions of 40 CFR Part 87. Several commenters have asked what type c indication the FAA will require. They are concerned that some I.D. plates may have to be redesigned, thus adding to the cost of production, if additional I.D. plate information data is required. After careful consideration of this problem, the FAA has devised the following 6 character marking scheme which should cover all possible marking problems that may be encountered and at the same time minimize the use of space on plates already being utilized. For engines that, in all respects, comply with the requirements of SFAR-27 and 40 CFR Part 87, the I.D. plate must contain the designation COMPLY. Any engines subject to SFAR-27, but which has been granted an exemption under any provision found in 40 CFR § 87.7(a) (4), § 87.7(b), (c) or (d), must contain the designator EXEMPT on the I.D. plate. Finally, any engine which is exempt from the requirements of SFAR-27 by reason of it being manufactured for use outside the United States [40 CFR § 87.7(a) (1)], the I.D. plate must be marked with the designator NON-US. These designations have been approved by the FAA and have been made part of Section 20 in the final rule. Other designation codes are possible for use. However, in order to retain as uniform a marking scheme as possible, only those designators approved by the Administrator of the FAA may be utilized.

Several additional recording requirements have also been included in Section 20 of the final rule. Section 20(c) requires that, for any engine which has been granted an exemption by reason of any provision found in 40 CFR § 87.7(a) (1), (a) (4), (b), (c), or (d), an indication of the exemption and the reason for the grant must be inserted in the permanent powerplant record (engine logbook or equivalent document), that accompanies the engine, at the time of manufacture. For example, if an engine has been granted an exemption by reason of it falling within the low production limits of 40 CFR § 87.7(b), the indication should state "EXEMPT for low production" or some similar notation. If an engine has been granted an exemption by reason of 40 CFR § 87.7(a) (1), the indication should read "NON-US, this engine does not comply with U.S. emissions requirements and must not be operated within the U.S."

Section 20(d) requires that, for engines rated in excess of 26.7 kilonewtons (Kn) that comply only with the required smoke number, the notation "May not be used as a commercial aircraft engine", as that term is defined in the SFAR 27-5, must be inserted in the permanent powerplant record at the time of engine manufacture. However, the I.D. plate designator COMPLY would be appropriate for these engines.

Finally, as previously mentioned, for aircraft assembled with engines exempt as a result of the export provision of 40 CFR § 87.7(a) (1), the notation "The aircraft may not be operated within the United States" must be inserted in the aircraft logbook at the time of engine installation. Other notations may be acceptable if prior FAA approval is obtained.

Stay of Emission Requirements for Class TF Engines

Subsequent to the publication of final rule 40 CFR Part 87, the General Aviation Manufacturers Association (GAMA) petitioned the Environmental Protection Agency for reconsideration of the smoke standard as applied to Class TF engines rated at 26.7 kn or below. Pursuant to an agreement between the parties, EPA has stayed the effectiveness of the smoke standard as applied to Class TF engines (48 FR 46481) October 12, 1983). The FAA has no way of knowing when or if EPA will lift this stay after reconsideration of the GAMA petition. Therefore, consistent with Section 3(b) of SFAR 27-5, the FAA will not enforce any additional requirements set forth in the final rule with respect to these engines while the stay is in effect. However, compliance with those requirements currently in effect will continue to be required. In addition, should EPA decide to reimpose any requirement previously imposed in 40 CFR Part 87, it will immediately become part of this rule.

Regulatory Impact Analysis

Prior to its enactment, the EPA determined that 40 CFR Part 87 would not constitute a major rule as defined by Executive Order 12291 (Order) and that it did not involve any significant increased costs or adverse effects on competition, employment, investment, productivity, innovation, or the ability of U.S. enterprises to compete with those of other countries when compared to the present regulations. The information base, including the economic analyses on which this determination was made, is collected in Public Docket No. OMSAPC-78-1 at the Environmental Protection Agency, Central Docket Section, West Tower Lobby, Gallery I, 401 M Street, S.W., Washington, D.C. 20460. In addition, several of the final EPA reports concerning this subject can be found as part of the docket for this proposed rule. As the purpose of the proposed amendments to SFAR 27 is to promulgate rules for the enforcement of revised 40 CFR Part 87, as required by statute, the FAA has made a determination that an additional analysis would, at this point, be duplicate and inappropriate. As a result, no new economic analysis will be conducted with regard to revised SFAR 27.

Impact on Small Entities

Because of the limited classes of engines to which 40 CFR Part 87 applies, the EPA earlier determined that enactment of that regulation would not have a significant economic impact on a substantial number of small entities (as defined by the Small Business Act). Therefore, no Regulatory Flexibility Analysis was prepared. Interested persons may review the information on which this determination was made at the locations previously mentioned. As the EPA is in a much better position to make a determination in that regard, the FAA adopts that finding.

Environmental Analysis

Pursuant to Department of Transportation, "Policies and Procedures for Considering Environmental Impacts" (FAA Order 1050.1C, Appendix 7, paragraph 5a.; 45 FR 2279, 2280, January 10, 1980), the FAA is categorically excluded from providing an environmental analysis with regard to the proposed amendments to SFAR 27 because it is mandated by law to issue regulations to ensure compliance with the EPA aircraft emissions standards and the EPA has performed all required environmental analyses prior to the issuance of those standards.

OMB Review

This action was submitted to the Office of Management and Budget for review as required by Executive Order 12291.

Good Cause Justification

Section 553 of the Administrative Procedure Act provides that the publication of a substantive rule shall be made not less than 30 days before its effective date except as otherwise provided by the agency for good cause found and published with the final rule. The EPA published the revised requirement of 40 CFR Part 87 on December 30, 1982. At that time, EPA announced a compliance date for the revised requirements of January 1, 1984. As previously stated, the FAA has a duty to issue regulations that ensure compliance with all aircraft emission standards. The amendments to SFAR 27 were published in notice form and the comments relating to that notice have been addressed. Inasmuch as the amendments to SFAR 27 are mainly procedural and the compliance date for CFR Part 87 was announced 13 months in advance, the FAA feels that there is good cause to dispense with the full 30-day publication period before the effectivity of SFAR 27-5.

Paperwork Reduction Act

Information collection requirements contained in this regulation (sections 9d, 12 and 20) have been approved by the Office of Management and Budget under the provisions of the Paperwork Reduction Act of 1980 (P.L. 96-511) and have been assigned OMB control number 2120-0508.

Accordingly, SFAR 27 of Title 14, Parts 11, 21, 43, 45, and 91 of the Code of Federal Regulations is revised and approved by the Office of Management and Budget under OMB control number 2120-0508, and § 11.101(b) of Subpart F is amended effective January 1, 1984.

NOTE: For reasons discussed earlier in the preamble: the FAA has determined that this document; (1) involves a proposed regulation which is not major under Executive Order 12291; (2) is not a significant rule pursuant to the Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979); and (3) it is certified under the criteria of the Regulatory Flexibility Act that this rule will not have a significant economic impact on a substantial number of small entities.

(Sec. 232, Clean Air Act, as amended Dec. 31, 1970, Pub. L. 91-604 (42 U.S.C. 1857f-10) as delegated (36 FR 3733); 40 CFR Part 87; secs. 307(c), 313(a), 601 and 603, Federal Aviation Act of 1958 (49 U.S.C. 1348(c), 1354(a), 1421, and 1423); 49 U.S.C. 106(g) (Revised, Pub. L. 97-449, January 12, 1983)).

Special Federal Aviation Regulation 27

Fuel Venting and Exhaust Emission Requirements For Turbine Engine Powered Airplanes

[Sec. 1 General requirements.

(a) This SFAR provides for the approval or acceptance by the Administrator of the FAA for the Administrator of the EPA of testing and sampling methods, analytical techniques, and related equipment not identical to those specified in this Part. Before either approves or accepts any such alternate, equivalent, or otherwise nonidentical procedures or equipment, the Administrator of the FAA or the Administrator of the EPA shall consult with the other in determining whether or not the action requires rulemaking under sections 231 and 232 of the Clean Air Act, as amended, consistent with the responsibilities of the Administrator of the EPA and the Secretary of Transportation under sections 231 and 232 of the Act. (42 U.S.C. 7571, 7572).

(b) U.S. airplanes. This SFAR applies to civil airplanes that are powered by aircraft gas turbine engines of the classes specified herein and that have U.S. Standard Airworthiness Certificates.

(c) Foreign airplanes. Pursuant to the definition of "aircraft" in 40 CFR 87.1(a), this SFAR applies to civil airplanes that are powered by aircraft gas turbine engines of the classes specified herein and that have foreign airworthiness certificates that are equivalent to U.S. Standard Airworthiness Certificates. This includes only those foreign civil airplanes that, if registered in the United States, would be required by applicable Federal Aviation Regulations to have a U.S. standard airworthiness certificate in order to conduct the operations intended for the airplane.

Pursuant to 40 CFR 87.3, this SFAR does not apply where inconsistent with an obligation assumed by the United States to a foreign country in a treaty, convention, or agreement.

Sec. 3 Relation to 40 CFR Part 87

(a) Reference in this regulation to 40 CFR Part 87 refers to Title 40 of the Code of Federal Regulations, Chapter I—Environmental Protection Agency, Part 87, Control of Air Pollution from Aircraft and Aircraft Engines (40 CFR Part 87), originally issued on July 6, 1973, and published in the Federal Register (38 FR 19088) on July 17, 1973, as revised effective January 31, 1983 (47 FR 58462), as amended effective January 20, 1983 (48 FR 2716).

(b) This SFAR contains regulations to ensure compliance with certain standards in Environmental Protection Agency (EPA), 40 CFR Part 87. If EPA takes any action, including the issuance of an exemption or issuance of a revised or alternate procedure, test method, or other regulation, the effect of which is to relax, or delay the effective date of any provision of 40 CFR Part 87 that is made applicable to an aircraft under this SFAR, the new relaxed EPA requirement, upon its effective date, is incorporated into this SFAR and supersedes the provisions of this SFAR that are based on the provisions of 40 CFR Part 87 that were relaxed by such action.

(c) Unless otherwise stated, all terminology and abbreviations in this SFAR that are defined in 40 CFR Part 87 have the meaning specified in that Part, and]

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[all terms in 40 CFR Part 87 that are not defined in that Part but that are used in this SFAR have the meaning given them in the Clean Air Act, as amended by 42 USC § 7401.

(d) All interpretations of 40 CFR Part 87 that are rendered by EPA also apply to this SFAR.

(e) Consistent with subsection (c) of this section, the following definitions apply:

(1) "Administrator of the FAA" means the Administrator of the Federal Aviation Administration or any other officer or employee of the Federal Aviation Administration to whom the authority involved may be delegated.

(2) "Administrator of the EPA" means the Administrator of the Environmental Protection Agency and any other officer or employee of the Environmental Protection Agency to whom the authority involved may be delegated.

Sec. 5 Additional EPA approvals and procedures

(a) If EPA, under 40 CFR 87.3(a) approves or accepts any testing and sampling procedures or methods, analytical techniques, and related equipment not identical to those specified in EPA Part 87, this SFAR requires a showing that such alternate, equivalent, or otherwise nonidentical procedures have been complied with, and that such alternate equipment was used to show compliance, unless the applicant elects to comply fully with 40 CFR Part 87.

(b) If the Administrator of the EPA after consultation with the Administrator of the FAA, prescribes special test procedures for any aircraft or aircraft engine that is not susceptible to satisfactory testing by the procedures in 40 CFR Part 87, this SFAR requires a showing that those special test procedures have been complied with.

(c) Wherever 40 CFR Part 87 requires agreement, acceptance, or approval by the Administrator of EPA, this SFAR requires a showing that such agreement or approval has been obtained.

Sec. 7 Relation to State and local regulations

(a) Pursuant to 42 U.S.C. § 7573, no state or political subdivision thereof may adopt or attempt to enforce any standard respecting emissions of any air pollutant from any aircraft or engine thereof unless that standard is identical to a standard made applicable to the aircraft by the terms of this SFAR.

(b) If EPA, by regulation or exemption, relaxes a provision of 40 CFR Part 87, no state or political subdivision thereof may adopt or attempt to enforce the terms of this SFAR that are superseded by the relaxed requirement.

(c) Consistent with § 87.6 of 40 CFR Part 87, if the Administrator of the FAA determines that any emission control regulation cannot be safely applied to an aircraft, that provision may not be adopted or enforced against that aircraft by a state or political subdivision thereof, even if it is in this SFAR.

(d) If any provision of this SFAR is rendered inapplicable to a foreign aircraft as provided in 40 CFR 87.3(c) and section 1(b) of this SFAR, that] [provision may not be adopted or enforced against that foreign aircraft by a state or political subdivision thereof.

Sec. 9 Petitions for rulemaking and exemption

(a) Notwithstanding Part 11 of the Federal Aviation Regulations (14 CFR Part 11), all petitions for rulemaking involving either the substance of an emission standard prescribed by EPA that is incorporated in this SFAR, or the compliance date for such standard or procedure, must be submitted to EPA. Information copies of such petitions are invited by the FAA.

(b) Petitions for rulemaking or exemption involving provisions of this SFAR that do not affect the substance or the compliance date of an emission standard or test procedure that is prescribed by EPA, and petitions for exemptions under the provisions for which the EPA has specifically granted exemption authority to the Administrator of the FAA in 40 CFR 87.7(a) (4), (b), (c), and (d), are subject to Part 11 of the Federal Aviation Regulations (14 CFR Part 11).

(c) Any engine for which a petition for exemption has been granted pursuant to subsection (b) of this section must be reported to the FAA by serial number and type certificate number on or before the last day of the month following the date of manufacture as defined in section 12 of this SFAR.

(d) Notwithstanding any other requirement of 14 CFR § 45.13, an aircraft engine specifically exempted from the applicable requirements of this SFAR pursuant to subsection (b) of this section must have the designator EXEMPT, or an equivalent designator approved by the Administrator of the FAA, inscribed as part of the identification data of the engine.

(e) Exemptions granted pursuant to any provision of 40 CFR 87 or subsection (b) of this section are not transferrable to any other engine.

(f) Exemptions requested pursuant to the provisions of 40 CFR § 87.7(a) (2) must comply with the procedural requirements set forth in 14 CFR § 21.199.

Sec. 10 Incorporation by reference

(a) General: This SFAR prescribes certain standards and procedures which are not set forth in full text in the rule. On November 22, 1983, those standards and procedures were approved by the Office of the Federal Register for incorporation by reference pursuant to 5 U.S.C. 552(a) and 1 CFR Part 51.

(b) Changes to incorporated matter. Incorporated matter which is subject to subsequent change is incorporated by reference according to the specific reference and to the identification statement. Adoption of any subsequent change in incorporated matter that impacts compliance with standards and procedures is made under 14 CFR Part 11 and 1 CFR Part 51.

(c) Identification statement. The complete title or description which identifies each published matter incorporated by reference in this SFAR is as follows:

(1) ICAO Annex 16—Environmental Protection, Volume II—Aircraft Engine Emissions, Appendices 2 through 6 dated 18 February 1982. This document can be obtained from the International Civil Aviation Organization, P.O. Box 400, Succursale: Place de L'Aviation Internationale, 1000 Sherbrooke Street West, Montreal, Quebec, Canada H3A 2R2 at $3.00 per copy.

(d) Availability for inspection. A copy of each publication incorporated by reference in this SFAR is available for public inspection at the following locations:]

[(1) FAA Office of the Chief Counsel, Rules Docket, Room 916, Federal Aviation Administration Headquarters Building, 800 Independence Avenue, S.W., Washington, D.C. 20591

(2) Department of Transportation, Branch Library, Room 930, Federal Aviation Administration Headquarters Building, 800 Independence Avenue, S.W., Washington, D.C. 20591

(3) The respective offices of the Federal Aviation Administration as follows:

(i) New England Regional Office, 12 New England Executive Park, Burlington, Massachusetts 01803.

(ii) New York Aircraft Certification Office, 181 South Franklin Avenue, Room 202, Valley Stream, New York 11581.

(iii) Atlanta Aircraft Certification Office, 1075 Innerloop Road, College Park, Georgia 30337.

(iv) Chicago Aircraft Certification Office, 2300 East Devon, Des Plaines, Illinois 60018.

(v) Central Regional Office, 601 East Twelfth Street, Kansas City, Missouri 64106.

(vi) Southwest Regional Office, 4400 Blue Mound Road, Fort Worth, Texas 76101.

(vii) Denver Aircraft Certification Field Office, 10455 East 25th Avenue, Aurora, Colorado 80010.

(viii) Northwest Regional Office, 17900 Pacific Highway South, Seattle, Washington 98168.

(ix) Western Aircraft Certification Field Office, 15000 Aviation Boulevard, Hawthorne, California (Mail Address: P.O. Box 92007 Worldway Postal Center, Los Angeles, California 90009).

(x) Anchorage Aircraft Certification Field Office, 701 C. Street, Anchorage, Alaska 99513.

(xi) Honolulu Aircraft Certification Field Office, Prince Kuhio Building, 300 Ala Moana Boulevard, Room 7108, Honolulu, Hawaii (Mail Address: P.O. Box 50246, Honolulu, Hawaii 96850).

(xii) Los Angeles Aircraft Certification Office, 4334 Donald Douglas Drive, Long Beach, California 90808.

(xiii) Brussels Aircraft Certification Staff, 15 Rue de la Loi, B-1040 Brussels, Belgium.

(xiv) FAA Representative, Office of U.S. Consulate General, Avenida Presidente Wilson, 147 Rio De Janeiro, Brazil.

(4) The Office of the Federal Register, Room 8401, 1100 "L" Street, NW., Washington, D.C.

Sec. 11 Compliance with airworthiness regulations

It must be shown that the airplane meets the airworthiness regulations constituting the type certification basis of the airplane under all conditions in which compliance with this SFAR is shown.

Sec. 12 Date of manufacture

As used in this SFAR, unless 40 CFR Part 87 of the Clean Air Act, as amended, requires otherwise, the date on which an aircraft engine is] [“manufactured” is the date on which that individual engine is originally approved by the FAA, or by a foreign country of manufacture, for installation on an aircraft. Notwithstanding any other requirements of 14 CFR § 45.13, beginning January 1, 1984, the date of manufacture (month and year) must be included as part of the identification data of engines manufactured on or after that date.

Sec. 13 Engine classes and test configuration

(a) Consistent with section 3(c) of this SFAR, the following definitions in 40 CFR 87.1 apply:

(1) “Aircraft engine” means a propulsion engine which is installed in or which is manufactured for installation in an aircraft.

(2) “Class TP” means all aircraft turboprop engines.

(3) “Class TF” means all turbofan or turbojet aircraft engines except engines of Class T3, T8, and TSS.

(4) “Class T3” means all aircraft gas turbine engines of the JT3D model family.

(5) “Class T8” means all aircraft gas turbine engines of the JT8D model family.

(6) “Class TSS” means all aircraft gas turbine engines employed for propulsion of aircraft designed to operate at supersonic flight speeds.

(7) “Commercial aircraft engine” means any aircraft engine used or intended for use by an “air carrier” (including those engaged in “intrastate air transportation”) or a “commercial operator” (including those engaged in “intrastate air transportation”) as these terms are defined in the Federal Aviation Act and the Federal Aviation Regulations.

(8) “Commercial aircraft gas turbine engine” means a turboprop, turbofan, or turbojet commercial aircraft engine.

(b) As prescribed in 40 CFR Part 87, the complete engine as configured for final acceptance testing, including all accessories that might reasonably be expected to influence emissions to the atmosphere excluding auxiliary gearbox-mounted components required to drive aircraft systems and service air bleed, must be functional for all testing under this SFAR.

Sec. 14 Compliance

(a) Compliance with the fuel venting emissions requirements of this SFAR that apply beginning on February 1, 1974, and beginning January 1, 1975, may be shown by any means of compliance, applied to the airframe of the engine, that prevents the intentional discharge of fuel from fuel nozzle manifolds after the engines are shut down. Acceptable means of compliance include the following:

(1) Incorporation of an FAA approved system that recirculates the fuel back into the fuel system.

(2) Capping or securing the pressurization and drain valve.

(3) Manually draining the fuel from a holding tank into a container.

(b) Continued compliance with the exhaust emissions requirements of this SFAR that became effective on February 1, 1974, January 1, 1975, January 1, 1978, and January 1, 1984, for engines for which the type design has been shown to meet those requirements, is demonstrated if the engine is maintained in accordance with applicable maintenance requirements for 14 CFR Chapter I.]

[methods of demonstrating compliance and all model designations previously having been found acceptable to the Administrator of the FAA shall be deemed to continue to be an acceptable demonstration of compliance with the specific standards for which they were approved.

(c) Each applicant must allow the Administrator of the FAA to make, or witness, any test necessary to determine compliance with the applicable provisions of this SFAR.

(d) An acceptable alternative to testing every engine is described in Appendix 6 to Volume II—Aircraft Engine Emissions, of ICAO Annex 16—Environmental Protection, 18 February 1982, incorporated herein by reference as indicated in Section 10. Other methods of demonstrating compliance may be approved by the Administrator of the FAA with the concurrence of the Administrator of the EPA.

Sec. 15 Type certificates

(a) Notwithstanding Part 21 of the Federal Aviation Regulations, and irrespective of the date of application, no type certificate is issued, on and after the dates specified in subparagraphs (a) (1) through (a) (5) of this section, for the airplanes specified therein, unless:

(1) For airplanes powered by engines of Class TF, Class TP, Class T3, Clas
T8, or Class TSS, the airframe or engine complies with the fuel ventir
emissions requirements and related test procedures of 40 CFR Part 87 th
became effective on February 1, 1974, and January 1, 1975;

(2) For airplanes powered by engines of Class T8, each engine complies w
the exhaust emissions requirements and related test procedures of 40 CFR P
87 that became effective on February 1, 1974;

(3) For airplanes powered by engines of Class TF that have a rated power
29,000 pounds thrust or greater, each engine complies with the exhau
emissions requirements and related test procedures of 40 CFR Part 87 th
became effective on January 1, 1976;

(4) For airplanes powered by engines of Class T3, each engine manufactur
on or after January 1, 1978, complies with the exhaust emissions requiremer
and related test procedures of 40 CFR Part 87 that became effective on Janua
1, 1978; and

(5) For airplanes powered by engines of Class TP, Class TF, Class T3, Class T8, and Class TSS—each engine manufactured on or after January 1, 1984, complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that apply beginning January 1, 1984.

(b) Notwithstanding Part 21 of the Federal Aviation Regulations, and irrespective of the date of application, no type certificate is issued, on and after the dates specified in paragraphs (a) (2), (a) (3) and (a) (4) of this section, for an engine specified therein unless the engine complies with that subparagraph.

(c) Notwithstanding Part 21 of the Federal Aviation Regulations and irrespective of the date of application, no type certificate is issued on or after January 1, 1984, for any Class TP, Class TF, Class T3, Class T8, or Class TSS engine unless the engine complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that apply beginning January 1, 1984.]

[Sec. 17 Supplemental or amended type certificates

(a) Notwithstanding Part 21 of the Federal Aviation Regulations, and irrespective of the date of application, no supplemental or amended type certificate is issued on and after the dates specified in paragraphs (a) (1) through (a) (5) of this section, for the airplanes specified therein, unless:

(1) For airplanes powered by engines of Class TF, Class TP, Class T3, Class T8, or Class TSS, the airframe or engine complies with the fuel venting emissions requirements and related test procedures of 40 CFR Part 87 that became effective on February 1, 1974, and January 1, 1975;

(2) For airplanes powered by engines of Class T8, each engine complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that became effective on February 1, 1974;

(3) For airplanes powered by engines of Class TF that have a rated power of 29,000 pounds thrust or greater, each engine complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that became effective on January 1, 1976;

(4) For airplanes powered by engines of Class T3, each engine manufactured on or after January 1, 1978, complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that became effective on January 1, 1978; and

(5) For airplanes powered by engines of Class TP, Class TF, Class T3, Class T8, and Class TSS—each engine manufactured on or after January 1, 1984, complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that apply beginning January 1, 1984.

(b) Notwithstanding Part 21 of the Federal Aviation Regulations, and irrespective of the date of application, no supplemental or amended type certificate is issued, on or after the dates specified in paragraphs (a) (2), (a) (3), and (a) (4) of this section, for an engine specified therein, unless the engine complies with that paragraph.

(c) Notwithstanding Part 21 of the Federal Aviation Regulations and irrespective of the date of application, no supplemental or amended type certificate is issued on or after January 1, 1984, for any Class TP, Class TF, Class T3, Class T8, or Class TSS engine unless the engine complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that apply beginning January 1, 1984.

Sec. 19 Engine approvals

(a) On and after the dates specified in this paragraph, and notwithstanding Part 21 of the Federal Aviation Regulations, no original FAA approval for installation of an engine on aircraft covered by this SFAR (including FAA acceptance of an equivalent original approval issued on or before January 1, 1978, by a foreign country of manufacture) is made by the FAA:

(1) For an engine of Class T8, unless the engine complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that became effective on February 1, 1974;

(2) For an engine of Class TF that has a rated power of 29,000 pounds thrust or greater, unless the engine complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that became effective on January 1, 1976;]

[(3) For an engine of Class T3, unless each engine manufactured on or after January 1, 1978, complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that became effective on January 1, 1978; and

(4) For engines of Class TP, Class TF, Class T3, Class T8, or Class TSS, unless each engine manufactured on or after January 1, 1984, complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that apply beginning January 1, 1984.

Sec. 20 Identification Data and Recording Requirements

(a) On or after January 1, 1984, notwithstanding 14 CFR Part 45, no original FAA approval for installation of an engine on an airplane (including FAA acceptance of an equivalent original approval issued on or after January 1, 1984, by a foreign country of manufacture) is made by the FAA, for an engine covered by this SFAR unless that engine has secured to it an identification plate displaying the date of manufacture and a designation, approved by the Administrator of the FAA, that indicates compliance with applicable provisions of 40 CFR Part 87. Approved indicators include COMPLY, EXEMPT, and NON-US as appropriate.

(b) On or after January 1, 1984, notwithstanding 14 CFR Part 45, no person may secure an identification plate to any airplane engine covered by this SFAR unless that engine complies with the applicable provisions of this SFAR.

(c) On or after January 1, 1984, notwithstanding any other requirement of 14 CFR Part 43, for any engine granted an exemption pursuant to any applicable provision of 40 CFR § 87.7(a) (1), (a) (4), (b), (c), or (d), an indication of the type of exemption and the reason for the grant must be noted in the permanent powerplant record, that accompanies the engine, at the time of manufacture of the engine.

(d) On or after January 1, 1984, notwithstanding any other requirement of 14 CFR Part 43, for any engine with a rated thrust in excess of 26.7 kilonewtons which does not comply with the hydrocarbon emissions standards of 40 CFR Part 87, the statement "May not be used as a commercial aircraft engine" must be noted in the permanent powerplant record, that accompanies the engine, at the time of manufacture of the engine.

(e) On or after January 1, 1984, notwithstanding any other requirement of 14 CFR Part 43, for any aircraft assembled with an engine that has been granted an exemption pursuant to 40 CFR § 87.7(a) (1), the notation "the aircraft may not be operated within the United States", or an equivalent notation approved by the Administrator of the FAA, must be inserted in the aircraft logbook, or alternate equivalent document, at the time of installation of the engine.

Sec. 21 Standard airworthiness certificates

Notwithstanding Part 21 of the Federal Aviation Regulations, and irrespective of the date of application, no standard airworthiness certificate is issued, on and after the dates specified in paragraphs (a) through (e) of this section, for the airplanes specified therein, unless:

(a) For airplanes powered by engines of Class TP, Class TF, Class T3, Class T8, or Class TSS the airframe or engine complies with the fuel venting emissions requirement and related test procedures of 40 CFR Part 87 that became effective on February 1, 1974, and January 1, 1975;]

[(b) For airplanes powered by engines of Class T8, each engine complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that became effective on February 1, 1974;

(c) For airplanes powered by engines of Class TF that have a rated power of 29,000 pounds thrust or greater, each engine complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that became effective on January 1, 1976;

(d) For airplanes powered by engines of Class T3, each engine manufactured on or after January 1, 1978, complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that became effective on January 1, 1978; and

(e) For airplanes powered by engines of Class TP, Class TF, Class T3, Class T8, and Class TSS—each engine manufactured on or after January 1, 1984, complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that apply beginning January 1, 1984.

Sec. 25 Operation

On and after the dates specified in paragraphs (a) through (e) of this section, no person may, within the United States, operate a airplane specified in those paragraphs unless:

(a) For airplanes powered by engines of Class TP, Class TF, Class T3, Class T8, or Class TSS, the airframe or the engine complies with the fuel venting emissions requirements and related test procedures of 40 CFR Part 87 that became effective on February 1, 1974, and January 1, 1975;

(b) For airplanes powered by engines of Class T8, each engine complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that became effective on February 1, 1974;

(c) For airplanes powered by engines of Class TF that have a rated power of 29,000 pounds thrust or greater, each engine complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that became effective on January 1, 1976;

(d) For airplanes powered by engines of Class T3, each engine manufactured on or after January 1, 1978, complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that became effective on January 1, 1978; and

(e) For airplanes powered by engines of Class TP, Class TF, Class T3, Class T8, and Class TSS—each engine manufactured on or after January 1, 1984, complies with the exhaust emissions requirements and related test procedures of 40 CFR Part 87 that apply beginning January 1, 1984.]

Special Federal Aviation Regulation 29

FAA Study of Limited IFR Operations in Rotorcraft

Adopted: January 3, 1975 **Effective: January 14, 1975**

(Published in 40 F.R. 2420, January 13, 1975)

The purpose of this Special Federal Aviation Regulation is to provide for the issue by the Administrator of approvals for limited operations under instrument flight rules (IFR) of certain transport category rotorcraft that are limited by their type certificates to operations under visual flight rules (VFR). Such operations are necessary to permit the collection of operational data in connection with an FAA study of limited rotorcraft operations in IFR conditions.

Under the current Federal Aviation Regulations a transport category rotorcraft is certificated for VFR operation only unless it has been shown that the rotorcraft fully complies with all of the airworthiness requirements for IFR operations. The FAA believes that cerrtain IFR operations can safely be conducted over low density routes, in off-airways operations, and in uncontrolled airspace with transport category rotorcraft that do not meet all of the present flight characteristics requirements. In this connection the FAA is conducting a study to determine whether a "limited" IFR category should be established for these rotorcraft, including flight characteristics and equipment requirements, operating procedures and limitations, flight crew requirements, and training requirements. After this study has been completed, rulemaking action may be initiated to amend the Federal Aviation Regulations to permit limited IFR operations with transport category rotorcraft that do not meet all of the present airworthiness requirements of Part 29 for unlimited operation under IFR.

Some data has already been collected from an operator of specially equipped Bell Model 212 helicopters that are flown by flight crews trained in operating those rotorcraft in IFR conditions in the Gulf of Mexico. These operations have been conducted under the authority of an exemption from the Federal Aviation Regulations. Based on information and data collected during these operations, the FAA believes the study should be expanded to include operations in other geographic areas. The FAA has also determined that any operator of transport category rotorcraft, whose aircraft equipment, procedures, and area of operation ensure a level of safety under limited IFR operations equivalent to that provided by the present requirements of Part 29, should be allowed to participate in this study. This Special Federal Aviation Regulation will allow this participation, which the FAA has determined will be in the public interest and will not compromise safety.

Under this Special Federal Aviation Regulation, the operator of a rotorcraft that is not otherwise certificated for IFR operations may conduct an approved limited IFR operation in the rotorcraft when an approval for the operation has been issued by the Administrator. Factors that will be considered by the Administrator in issuing an approval include:

1. The inherent characteristics of the rotorcraft to be operated, including flight characteristics, performance, approach speed and ability to terminate an approach.

2. The duality, redundancy, and independence of equipment in the rotorcraft, including controls, flight instruments, electrical, communication, and navigational systems, and power and fuel systems.

3. The operator's pilot training program, with special emphasis on crew coordination during IFR operations.

4. The experience of the pilots of the rotorcraft in the environment and weather conditions in which IFR operations are to be conducted.

5. The size and relative simplicity of the area in which IFR operations are to b conducted and the distance flown on each route segment.

This Special Federal Aviation Regulation also provides as part of the study th the FAA may approve the carriage in IFR operations of less than the 45 minutes additional fuel reserves required by § 91.23(c). In pertinent part, § 91.23 requires th in IFR conditions, the rotorcraft must have enough fuel to complete the contemplated flight, to fly from the airport of intended landing to the alternate airport, and fly thereafter for 45 minutes at normal cruising speed. This Special Federal Aviation Regulation permits the approval of less than 45 minutes, but not less than 30 minutes, of additional fuel reserve. A factor considered in granting this approval will be the environment in which the rotorcraft is to be operated.

In view of the fact that this amendment temporarily relieves a restriction in connection with operatins conducted as part of an FAA study, and since there is an immediate need for the data to be derived from the study, I find that notice and public procedure thereon are impractical and unnecessary, and good cause exists for making this amendment effective in less than 30 days.

(Sections 313(a), 601(a), and 603 of the Federal Aviation Act of 1958; 49 U.S.C. 1354(a), 1421(a), and 1423. Section 6(c) of the Department of Transportation Act; 49 U.S.C. 1655(c)).

In consideration of the foregoing, Special Federal Aviation Regulation 29 is adopted, effective January 14, 1975.

Special Federal Aviation Regulation 29-1

FAA Study of Limited IFR Operations in Rotorcraft

Adopted: December 30, 1975 **Effective: December 31, 1975**

(Published in 41 F.R. 1060, January 6, 1976)

The purpose of this Special Federal Aviation Regulation is to extend the expiration date of Special Federal Aviation Regulation No. 29 (SFAR No. 29) to provide for further time for the collection of operational data in connection with an FAA study of limited rotorcraft operations in IFR conditions. SFAR No. 29 was issued for a period of one year to provide for the issue by the Administrator of approvals for limited operatins under instrument flight rules (IFR) of certain transport category rotorcraft that are limited by their type certificates to operations under visual flight rules (VFR).

Under the current Federal Aviation Regulations a transport category rotorcraft is certificated for VFR operation only unless it has been shown that the rotorcraft fully complies with all of the airworthiness requirements for IFR operations. The FAA believes that certain IFR operations can safely be conducted over low density routes, in off-airways operations, and in uncontrolled airspace with transport category rotorcraft that do not meet all of the present flight requirements. As stated in the preamble to SFAR No. 29, the FAA is conducting a study to determine whether a "limited" IFR category should be established for these rotorcraft, including flight characteristics and equipment requirements, operating procedures and limitations, flight crew requirements, and training requirements.

Before the issuance of SFAR No. 29, the FAA had already collected data from an operator of specially equipped Bell Model 212 helicopters that are flown by flight crews trained in operating those rotorcraft in IFR conditions in the Gulf of Mexico. Those operations were conducted under the authority of an exemption from the Federal Aviation Regulations. Based on information and data collected during those operations, the FAA decided the study should be expanded to include operations in other geographic areas. In this connection, the FAA determined that it would be in the public interest and would not compromise safety to allow any operator of transport category rotorcraft to participate in the study, if its aircraft equipment, procedures, and area of operation ensure a level of safety under limited IFR operations equivalent to that provided by the present requirements of Part 29.

Although the FAA expected a number of hilicopter operators to participate in the study, during the first six months after the effective date of SFAR No. 29, no additional operators expressed an interest in participating in the study. A number of operators have indicated to the FAA a belief that the one-year effective period of SFAR No. 29 would not enable them to complete the actions necessary for limited helicopter IFR authorizatin, or to defray the necessary expenses through additional revenues.

Moreover, a number of navigational systems are under development and not yet fully operational that the FAA anticipates would be used in rotorcraft engaged in limited IFR operations. Information on operations using this equipment will be important to the FAA's decision on whether to initiate rulemaking.

In view of the foregoing, the FAA has determined that it is necessary to extend its study for an additional three year period to provide sufficient data upon which to base a decision whether to initiate rulemaking action to amend the Federal Aviation Regulations to permit IFR operations with transport category rotorcraft that do not meet all of the present airworthiness requirements of Part 29 for unlimited operation under IFR. Accordingly, this SFAR is being issued for a period of three years.

It should be noted that this SFAR, as did SFAR No. 29, provides as part of the study that the FAA may approve the carriage in IFR operations of less than the 45 minutes of additional fuel reserve required by § 91.23(c). In pertinent part, § 91.23 requires that, in IFR conditions, the rotorcraft must have enough fuel to complete the contemplated flight, to fly from the airport of intended landing to the alternate airport, and fly thereafter for 45 minutes at normal cruising speed. This Special Federal Aviation Regulation permits the approval of less than 45 minutes, but not less than 30 minutes, of additional fuel reserve. A factor considered in granting this approval will be the environment in which the rotorcraft is to be operated.

In view of the fact that this amendment temporarily relieves a restriction in connection with operations conducted as part of an FAA study, and since there is an immediate need for the data to be derived from the study, I find that notice and public procedure thereon are impractical and unnecessary, and good cause exists for making this amendment effective in less than 30 days.

(Sections 313(a), 601(a), and 603 of the Federal Aviation Act of 1958; 49 U.S.C. 1354(a), 1421(a), and 1423. Section 6(c) of the Department of Transportation Act; 49 U.S.C. 1655(c))

In consideration of the foregoing, Special Federal Aviation Regulation 29-1 is adopted, effective December 31, 1975.

Special Federal Aviation Regulation 29-2

FAA Study of Limited IFR Operations in Rotorcraft

Adopted: January 3, 1979 **Effective: January 3, 1979**

(Published in 44 F.R. 2362, January 11, 1979)

SUMMARY: This amendment reissues a special regulation which allows for limited operations under instrument flight rules (IFR) of certain transport category rotorcraft that are limited by their type certificates to operations under visual flight rules (VFR). It also amends the provisions of the special regulation by including Part 27 rotorcraft operations and deleting the airspace restrictions. The amendment is necessary to provide time for further study to determine whether the airworthiness requirements should be revised.

FOR FURTHER INFORMATION CONTACT:

Mr. Donald A. Schroeder, Safety Regulations Division, Flight Standards Service, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591; Telephone: 202-755-8715.

SUPPLEMENTAL INFORMATION: Under Part 27 or 29 of the Federal Aviation Regulations (FAR) a rotorcraft is certificated for VFR operation only, unless it has been shown that the rotorcraft fully complies with all of the airworthiness requirements for IFR operations. The FAA believes that certain IFR operations can be safely conducted with rotorcraft that do not meet all of the present flight characteristic requirements. Special Federal Aviation Regulation (SFAR) No. 29 was adopted to provide for the issue by the Administrator of approvals for this relief on an interim basis pending the conclusion of a study to determine whether a "limited" IFR category should be established for these rotorcraft, including flight characteristics and equipment requirements, operating procedures and limitations, flight crew requirements, and training requirements. The expiration date of SFAR No. 29 as amended by SFAR No. 29-1 (41 FR 1060), is December 31, 1978.

The FAA has established a Rotorcraft Regulatory Review Program which will involve a comprehensive review and upgrading of rules regarding rotorcraft airworthiness standards and operating requirements. This program will consider the development of IFR airworthiness standards for rotorcraft certification in Parts 27 and 29 of the FAR. This program will not be concluded by the December 31, 1978, termination date of SFAR No. 29.

The FAA has been requested by the Helicopter Association of America on behalf of their membership to consider including certain helicopters certificated to the airworthiness standards of Part 27 to allow IFR operations similar to those conducted under SFAR 29. In addition, it was requested that the airspace restrictions be deleted. Based upon the study results to date and the need to collect additional data, the FAA has determined that the requirements for specific approval of IFR routes and area of operation could be deleted without jeopardizing safety. The present IFR study provisions of SFAR 29 have not included Part 27 helicopters which are being used in pilot training programs leading towards instrument ratings in rotorcraft-helicopters. In addition, a number of these helicopters, operating VFR, presently require, under the interim standards for IFR certification, stringent and costly stability augmentation devices to be added to the flight control system before operating in instrument meteorological conditions. The need exists to expand the IFR study to include certain helicopters certificated to the airworthiness standards of Part 27 and evaluate the need for stability devices prior to imposing a large financial burden upon the industry.

In a continued effort to expand the data base of operational information, the FAA has, therefore, determined it advisable to amend SFAR 29 to delete the airspace restrictions and to include certain helicopters certificated to the airworthiness standards of Part 27.

If SFAR No. 29 were not to continue in effect until the completion of the rulemaking action generated by the Rotorcraft Regulatory Review Program, an undue burden could be placed on certain operators of helicopters meeting the criteria specified in SFAR No. 29 because it would prohibit IFR operations with those helicopters which might be allowed when the Rotorcraft Regulatory Review Program is completed. Thus, the FAA believes that it is in the public interest to allow IFR operations with certain rotorcraft that do not meet all of the present requirements of Parts 21, 27, 29, and 91 of the FAR pending a determination of whether or not new standards should be developed.

The expansion and effectivity of SFAR No. 29 to December 31, 1980, should provide the FAA sufficient time to determine what regulatory changes are necessary.

ADOPTION OF THE AMENDMENT

Since this amendment temporarily relieves a restriction in connection with operations conducted as part of an FAA study and imposes no additional burden on any person, I find that notice and public procedure are unnecessary and that good cause exists for making this amendment effective in less than 30 days.

Accordingly, Special Federal Aviation Regulation No. 29, as amended by SFAR No. 29-1, is reissued, effective January 3, 1979.

Sections 313(a), 601(a), and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421(a), and 1423, and section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).)

The Federal Aviation Administration has determined that this document is not significant in accordance with the criteria required by Executive Order 12044, and set forth in the proposed "Department of Transportation Regulatory Policies and Procedures" published in the FEDERAL REGISTER June 1, 1978 (43 FR 23925).

Special Federal Aviation Regulation 29-3

Limited IFR Operations of Rotorcraft

Adopted: October 21, 1980 **Effective: January 1, 1981**

(Published in 45 FR 71919, October 30, 1980)

SUMMARY: This amendment extends the effectivity of Special Federal Aviation Regulation No. 29-2 which allows for limited operations under instrument flight rules (IFR) for certain normal and transport category rotorcraft that are limited by their type certificates to operations under visual flight rules (VFR). The extension is necessary to provide time for further study to determine whether the airworthiness requirements should be revised.

FOR FURTHER INFORMATION CONTACT: Mr. Roger E. Riviere, Regulatory Review Branch (AVS-22), Safety Regulations Staff, Associate Administrator for Aviation Standards, Federal Aviation Administration, 800 Independence Ave. S.W., Washington, D.C. 20591, telephone (202) 755-8714.

SUPPLEMENTAL INFORMATION: Under Part 27 or 29 of the Federal Aviation Regulations (FAR) a rotorcraft is certificated for visual flight rules (VFR) operation only, unless it is shown that the rotorcraft fully complies with all of the airworthiness requirements for IFR operations. Certain IFR operations can be safely conducted with rotorcraft that do not meet all of the present flight characteristic requirements. Special Federal Aviation Regulation (SFAR) No. 29 was adopted to allow the Administrator to issue approvals for these operations on an interim basis pending the conclusion of a study to determine whether a "limited" IFR category should be established for these rotorcraft, including flight characteristics and equipment requirements, operating procedures and limitations, flightcrew requirements, and training requirements. SFAR No. 29, as amended by SFAR No. 29-2 (44 FR 2362), expires December 31, 1980.

The FAA has established a Rotorcraft Regulatory Review Program which involves a comprehensive review and upgrading of rules regarding rotorcraft airworthiness standards and operating requirements. This program will consider the development of IFR airworthiness standards for rotorcraft certification in Parts 27 and 29 of the FAR. It is the intent of the FAA to rescind this SFAR upon adoption of the new rotorcraft IFR certification standards in Parts 27 and 29 as part of the Rotorcraft Regulatory Review Program. This program will not be concluded by the December 31, 1980, termination date of SFAR No. 29 as amended. If the SFAR expires before the completion of the rulemaking action generated by the program, an undue burden could be placed on certain operators of helicopters meeting the criteria specified in the SFAR because it would prohibit IFR operations with those helicopters which might be allowed when the Rotorcraft Regulatory Review Program is completed. This is consistent with Executive Order 12044 issued by President Carter in that it minimizes compliance costs and burdens on the public. Results have not shown any adverse safety effect during the time that it was in effect and none are expected in the future should this SFAR be extended. Thus, the FAA has determined that it is in the public interest to extend the effectivity of SFAR 29, as amended, pending a determination of whether or not new standards should be developed.

ADOPTION OF THE AMENDMENT

Since this amendment temporarily relieves a restriction in connection with operations conducted as part of an FAA study and imposes no additional burden on any person, I find that notice and public procedure are unnecessary.

Accordingly, Special Federal Aviation Regulation No. 29, as amended by SFAR No. 29-2, is reissued, effective January 1, 1981.

Sections 313(a), 601(a), and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421(a), and 1423) and section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).)

The Federal Aviation Administration has determined that this document is not significant in accordance with the criteria required by Executive Order 12044, as implemented by the Department of Transportation Regulatory Policies and Procedures (44 FR 11034; Fedruary 26, 1979).

Special Federal Aviation Regulation 29-4

Limited IFR Operations of Rotorcraft

Adopted: December 28, 1982 Effective: January 1, 1983

(Published in 48 FR 631, January 6, 1983)

SUMMARY: This amendment extends the effectivity of Special Federal Aviation Regulation (SFAR) No. 29-3, which allows limited operations under instrument flight rules (IFR) of certain normal and transport category rotorcraft that are limited by their type certificates to operations under visual flight rules (VFR). The extension is necessary to prevent imposing any economic burden upon those operators already authorized, equipped, and qualified to conduct operations under SFAR No. 29, which would occur if SFAR 29-3 were permitted to terminate before Amendment No. 1 of the Rotorcraft Regulatory Review Program is issued and effective.

FOR FURTHER INFORMATION CONTACT: Mike Sacrey or Win Karish; Operations Branch (AFO-820); General Aviation & Commercial Division; Office of Flight Operations; Federal Aviation Administration; 800 Independence Ave., SW.; Washington, D.C. 20591; telephone (202) 426-8194.

SUPPLEMENTARY INFORMATION:

Background

Under Part 27 or Part 29 of the Federal Aviation Regulations (FAR), a rotorcraft is certificated for VFR operation only, unless it has been shown that the rotorcraft fully complies with all of the airworthiness requirements for instrument flight rules (IFR) operations. Since certain IFR operations can be safely conducted with rotorcraft that do not meet all of the present flight characteristic requirements, SFAR No. 29 was adopted by the Administrator on January 3, 1975 (40 FR 2420; January 13, 1975). SFAR No. 29 allowed the Administrator to issue approvals for such operators, on an interim basis, pending the conclusion of a study to determine whether a "limited" IFR category should be established for these rotorcraft, including flight characteristics and equipment requirements, operating procedures and limitations, flightcrew requirements, and training requirements. The expiration date of SFAR No. 29, as amended by SFAR No. 29-3 (45 FR 71919; October 30, 1980), is December 31, 1982.

The FAA has established a Rotorcraft Regulatory Review Program which will involve a comprehensive review and upgrading of requirements. This program will consider the development of IFR airworthiness standards for rotorcraft certification in Parts 27 and 29 of the FAR. It will not be concluded by the December 31, 1982, termination date of SFAR No. 29-3.

Discussion

If SFAR No. 29 were to expire before completing the rulemaking action generated by the Rotorcraft Regulatory Review Program, there would be no regulatory basis to allow continued IFR rotorcraft operations, thereby creating an undue burden for those operators of helicopters meeting the criteria specified in SFAR No. 29.

Pending the issuance and effectivity of new standards to be established by Amendment No. 1 of the Rotorcraft Regulatory Review Program, the FAA believes that it is in the public interest to allow continued IFR operations with certain rotorcraft that do not meet all of the present requirements of Parts 21, 27, 29, and 91 of the FAR. With the issuance of SFAR No. 29-4, operators may continue to apply for SFAR 29 approvals until Amendment No. 1 of the Rotorcraft Regulatory Review Program (Amendment No. 1) is effective. After Amendment No. 1 is effective, all applicants for certification of IFR rotorcraft operations will have to comply with the provisions of that amendment. When Amendment No. 1 becomes effective, SFAR No. 29-4 (and approvals issued under SFAR Nos. 29 through 29-4) will remain effective for operators holding approvals obtained before the effective date of Amendment No. 1. SFAR 29-4 will terminate when all approvals issued under SFAR Nos. 29 through 29-4 are surrendered, revoked, or otherwise terminated.

Need for Immediate Adoption

Since this amendment temporarily extends the effectivity of a rule which permits continued IFR rotorcraft operations by operators equipped and qualified to comply with Special Federal Aviation Regulation No. 29 and therefore imposes no additional burden on any person, I find that notice and public procedure are unnecessary and that good cause exists for making this amendment effective in less than 30 days.

THE AMENDMENT

Accordingly, Special Federal Aviation Regulation No. 29, as amended by Special Federal Aviation Regulation No. 29-3 (14 CFR Parts 21, 27, 29, and 91), is reissued and amended, effective January 1, 1983.

(Sections 313(a), 601(a), and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421(a), and 1423) and section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)))

NOTE: Since this document only extends the effectivity of a current regulation and does not impose a burden on the public or aviation industry, the FAA has determined that this document involves a regulation which is not a major rule under Executive Order 12291, is not a significant rule under Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979), and does not warrant preparing a regulatory evaluation because the anticipated impact is minimal. For the same reason, I certify that this amendment will not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

[Special Federal Aviation Regulation 29

[FAA Study of Limited IFR Operations in Rotorcraft

1. Contrary provisions of Parts 21, 27, and 29 of the Federal Aviation Regulations notwithstanding, an operator of a rotorcraft that is not otherwise certificated for IFR operations may conduct an approved limited IFR operation in the rotorcraft when—

(a) FAA approval for the operation has been issued under paragraph 2 of this SFAR;

(b) The operator complies with all conditions and limitations established by this SFAR and the approval; and

(c) A copy of the approval and this SFAR are set forth as a supplement to the Rotorcraft Flight Manual.

2. FAA approval for the operation of a rotorcraft in limited IFR operations may be issued when the following conditions are met:

(a) The operation is approved as part of the FAA study of limited rotorcraft IFR operations.

(b) Specific FAA approval has been obtained for the following:

(i) The rotorcraft (make, model, and serial number).

(ii) The flightcrew.

(iii) The procedures to be followed in the operation of the rotorcraft under IFR and the equipment that must be operable during such operations.

(c) The conditions and limitations necessary for the safe operation of the rotorcraft in limited IFR operations have been established, approved, and incorporated in the operating limitations section of the Rotorcraft Flight Manual.

3. An approval issued under paragraph 2 of this Special Federal Aviation Regulation and the change to the Rotorcraft Flight Manual specified in paragraph 2(c) of this Special Federal Aviation Regulation constitute a supplemental type certificate for each rotorcraft approved under paragraph 2 of this SFAR. The supplemental type certificate will remain in effect until the approval to operate issued under the Special Aviation Regulation is surrendered, revoked, or otherwise terminated.

4. Notwithstanding § 91.23(a) (3) of the Federal Aviation Regulations, a person may operate a rotorcraft in a limited IFR operation approved under paragraph 2(a) of this Special Federal Aviation Regulation with enough fuel to fly, after reaching the alternate airport, for not less than 30 minutes, when that period of time has been approved.

5. Expiration.

(a) New applications for limited IFR rotorcraft operations under SFAR No. 29 may be submitted for approval until, but not including, the effective date of Amendment No. 1 of the Rotorcraft Regulatory Review Program. On and after the effective date of Amendment No. 1 of the Rotorcraft Regulatory Review Program, all applicants for certification of IFR rotorcraft operations must comply with the applicable provisions of the Federal Aviation Regulations.

(b) This Special Federal Aviation Regulation will terminate when all approvals issued under Special Federal Aviation Regulation No. 29 are surrendered, revoked, or otherwise terminated.

Special Federal Aviation Regulation 41

Airworthiness Standards: Reciprocating and Turbopropeller-Powered Small Multiengine Airplanes—Increase in Approved Takeoff Weights and Passenger Seating Capacities

Adopted: September 7, 1979 **Effective: October 17, 1979**

(Published in 44 FR 53723, September 17, 1979)

SUMMARY: This amendment adopts a new Special Federal Aviation Regulation (SFAR) which prescribes additional airworthiness standards applicable to existing propeller driven multiengine small airplanes to allow their type and airworthiness recertification at weights in excess of the limitation of 12,500 pounds maximum certificated takeoff weight, or with an increase in the number of passenger seats, or both. The rules applicable to air taxi and commercial operators (Part 135) are amended to allow the operation of airplanes certificated under the SFAR. In addition, the operating rules (Parts 91 and 135) are amended to require that airplanes certificated under the SFAR at weights in excess of 12,500 pounds meet updated interior material flammability requirements within one year of initial airworthiness certification. These amendments are intended to allow the design capabilities of certain existing small airplanes to be more fully utilized. They are also designed to increase aircraft availability for the commuter market that is burgeoning since enactment of the Airline Deregulation Act of 1978.

FOR FURTHER INFORMATION CONTACT:

Raymond E. Ramakis, Safety Regulations Staff (AVS-24), Federal Aviation Administration, 800 Independence Avenue, S.W. Washington, D.C. 20591 Telephone (202) 755-8716.

* * * * * *

ADOPTION OF THE AMENDMENT

Accordingly, the Federal Aviation Regulations (14 CFR Chapter I) are amended, effective October 17, 1979.

(Secs. 313(a), 601, 603, and 604, Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, and 1424); sec. 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

NOTE—The FAA has determined that this document involves a regulation which is not significant under Executive Order 12044, as implemented by DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). A copy of the final evaluation prepared for this action is contained in the regulatory docket. A copy of it may be obtained by writing to Raymond E. Ramakis, Safety Regulations Staff (AVS-24), Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591.

NOTE: The complete preamble to SFAR 41 is contained in Change 35 to Part 91 in Amendment 91-159.

Special Federal Aviation Regulation 41A

Increase in Approved Takeoff Weights and Passenger Seating Capacities: Correction

Adopted: April 7, 1980 **Effective: April 14, 1980**

(Published in 45 FR 25046, April 14, 1980)

SUMMARY: This action makes editorial corrections to Special Federal Aviation Regulation (SFAR) 41 adopted on September 7, 1979. The SFAR prescribes additional airworthiness requirements applicable to certain existing multiengine small airplanes to allow an increase in approved takeoff weights and passenger seating capacities.

FOR FURTHER INFORMATION CONTACT:

Eli S. Newberger, Safety Regulations Staff, AVS-24, Federal Aviation Administration, 800 Independence Ave., S.W., Washington, D.C. 20591, Telephone (202) 755-8716.

SUPPLEMENTARY INFORMATION:

This amendment of SFAR 41 (44 FR 53723, September 17, 1979) is editorial in nature to provide an omitted date, change an incorrectly stated date, and delete a regulatory reference listed in error.

As indicated in the preamble, SFAR 41 is applicable to existing propeller-driven multiengine small airplanes. The existing airplanes eligible for amended or supplemental type certificates are those type certificated prior to the effective date of the SFAR; i.e., October 17, 1979. This amendment provides the omitted date in paragraphs 1.(a) and 1.(b).

Paragraph 5.(b)(3) of the SFAR inadvertently cites the certification cutoff date of the given class of airplanes as July 1, 1970. Since this paragraph parallels § 135.169(b)(3), for consistency, the date is corrected to July 19, 1970.

Of the three sections of Appendix A, Part 135, referenced in paragraph 5.(c) of the SFAR, section 19.(b)(3) does not relate to landing requirements and was inadvertently included. Paragraph 5.(c) and the corresponding preamble discussion are amended by deleting the erroneous reference.

This amendment corrects the editorial errors as noted and good cause exists for making the amendment effective upon publication in the FEDERAL REGISTER [April 14, 1980].

ADOPTION OF AMENDMENT

Accordingly, the preamble of SFAR 41 and the text of SFAR 41 of the Federal Aviation Regulations (14 CFR SFAR 41) are amended, effective April 14, 1980.

[Secs. 313(a), 601, 603, and 604, Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, and 1424); Sec. 6(c), Department of Transportation Act (49 U.S.C. 1655(c)).]

NOTE: The FAA has determined that this document involves a regulation which is not significant under Executive Order 12044, as implemented by DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979).

Special Federal Aviation Regulation 41B

Increase in Approved Takeoff Weights and Passenger Seating Capacities

Adopted: December 2, 1980 **Effective: December 8, 1980**

(Published in 45 FR 80972, December 8, 1980)

SUMMARY: This amendment specifies the additional requirements for airplane designs certificated under Special Federal Aviation Regulation No. 41 (SFAR 41) that are necessary to comply with the airworthiness standards of International Civil Aviation Organization (ICAO), Annex 8. Manufacturers or modifiers of these airplanes may voluntarily elect to comply with these additional requirements to facilitate international operations. SFAR 41 was issued on September 7, 1979, and amended on April 7, 1980, to clarify its applicability. SFAR 41 prescribes additional airworthiness standards applicable to existing propeller-driven multiengine small airplanes to allow their type and airworthiness certification at weights in excess of 12,500 pounds maximum certificated takeoff weight, or with an increase in the number of passenger seats, or both.

Comments must be received on or before March 9, 1981.

FOR FURTHER INFORMATION CONTACT:

Eli S. Newberger, Regulatory Projects Branch (AVS-24), Safety Regulations Staff, Associate Administrator for Aviation Standards, Federal Aviation Administration, 800 Independence Ave., S.W., Washington, D.C. 20591. Telephone (202) 755-8716.

ADDRESS: Comments on this amendment may be mailed in duplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attn: Rules Docket (AGC-204), Docket No. 18315, 800 Independence Avenue, SW., Washington, D.C. 20591: or delivered in duplicate to: Room 916, 800 Independence Avenue, SW., Washington, D.C. 20591. All comments must be marked: Docket No. 18315. Comments may be inspected in the Rules Docket weekdays, except Federal holidays, between 8:30 a.m. and 5:00 p.m.

SUPPLEMENTARY INFORMATION:

Background

SFAR 41 was issued to provide for increased availability and utility of existing small multiengine propeller-driven airplanes in U.S. domestic commuter service by permitting type and airworthiness certification at weights above the limitation of 12,500 pounds maximum certificated takeoff weight. The SFAR permits an increase in the maximum certificated takeoff weight above 12,500 pounds, or an increase in passenger seating, or both, provided the maximum zero fuel weight does not exceed 12,500 pounds. Aircraft eligible for compliance with the SFAR must have been certificated to Federal Aviation Regulations Part 23 (FAR 23) prior to October 17, 1979, and an application for certification to SFAR 41 for the airplane must be filed prior to October 17, 1981. The production of airplanes certificated above 12,500 pounds, however, will be limited to 10 years after the effective date of SFAR 41, that is, until October 17, 1989.

No limitation has been established for the operational life of individual aircraft that were manufactured in conformance to a design approved under SFAR 41 prior to October 17, 1989.

Discussion

Certification under SFAR 41, as that regulation is presently worded, requires an endorsement on the airworthiness certificate to indicate that the airplane at weights in excess of 5,700 kg (12,566 pounds) does not meet ICAO Annex 8, "*International Standards, Airworthiness of Aircraft, to the Convention on International Civil Aviation.*" In the public rulemaking process followed before adoption of SFAR 41, technical differences were acknowledged to exist between SFAR 41 and ICAO Annex 8. After issuance of the SFAR, it was called to the FAA's attention that certain airplanes certificated to SFAR 41 could also be shown to comply with ICAO Annex 8. As written, however, SFAR 41 specifically requires all individual airworthiness certificates issued for aircraft type certificated under SFAR 41 to be specifically annotated otherwise. The purpose of this amendment is to eliminate this contradiction and allow those aircraft which do comply with ICAO Annex 8 to be free of statements to the contrary on their airworthiness certificates.

Article 33 of the Convention on International Civil Aviation (Chicago Convention) provides for the recognition of airworthiness certificates between contracting States when the airworthiness standards established by the Convention are met. The airworthiness standards established by the Convention are contained in ICAO Annex 8. Part III of ICAO Annex 8 sets forth objective standards applicable to airplanes of over 5,700 kg (12,566 pounds), maximum certificated takeoff weight intended for the carriage of passengers or cargo or mail in international air navigation. Noncompliance with these standards could seriously inhibit the international operations of affected airplanes.

The FAA, in the period since issuance of SFAR 41, has compared the airworthiness standards in Part III of ICAO Annex 8 with the airworthiness standards in FAR 23 plus SFAR 41. In this connection, the FAA has determined which specific FAR 25 airworthiness requirements must be met to ensure compliance with ICAO Annex 8, and they are listed in the body of the rule. It should be emphasized that the election to seek a more flexible international operations capability for airplanes already certificated to SFAR 41 by complying with these additional requirements is voluntary.

When an applicant elects to comply with the additional requirements of this amendment, the type certification basis statement on the type certificate data sheet or supplemental type certificate will indicate that the design meets the requirements of ICAO Annex 8. Aircraft covered under these certificates are excepted from the airworthiness certificate endorsement required by section 4(b) of SFAR 41. Applications for certification under SFAR 41 must be on file before October 17, 1981. However, applications for certification under the additional standards contained in this amendment may be made at any time for aircraft already certificated to SFAR 41. Since the additional standards of this amendment reflect specific standards of FAR 25 which may change after this amendment, the standards cited are those in effect on October 17, 1979, the effective date of SFAR 41.

Request For Comments

Interested persons are invited to submit comments on only this amendment. Communications should identify the docket number and be submitted in duplicate to the address specified above. All communications received on or before the closing date for comments will be considered by the Administrator. This amendment may be changed in the light of the comments received. All comments received will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons.

Notice and Public Procedure

The FAA recognizes that although the objective of SFAR 41 was met to increase the utilization of certain FAR 23 aircraft in U.S. domestic commuter service, difficulties may be encountered with the operation of such aircraft in foreign countries to the extent that the FAA precludes these aircraft from meeting the standard of ICAO Annex 8. In view of this, the FAA has determined those standards that will permit the voluntary compliance by persons seeking to undertake international operations with airplanes certificated under SFAR 41. Since this action is necessary to avoid imposing an undue burden on the international operations of these airplanes and since the FAA had no intention to preclude voluntary compliance with ICAO Annex 8 when SFAR 41 was issued, I find that notice and public procedure are impractical and contrary to the public interest and that good cause exists for making this amendment effective in less than 30 days. Accordingly, this amendment is effective on the date it is published in the *Federal Register* (45 FR 80972, 12/8/80).

ADOPTION OF AMENDMENT

In consideration of the foregoing, SFAR 41 of the Federal Aviation Regulations [14 CFR SFAR 41] is amended effective December 8, 1980.

[Sec. 313(a), 601, 603, 604, Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424); Sec. 6(c), Department of Transportation Act (49 U.S.C. 1655(c))]

NOTE: The FAA has determined that this document involves an amendment which is not considered to be significant under the procedures and criteria prescribed by Executive Order 12044 as implemented by Department of Transportation Policies and Regulatory Procedures (44 FR 11034; February 26, 1979). A copy of the final evaluation prepared for this action is contained in the regulatory docket. A copy of it may be obtained by contacting the person identified above under the caption "FOR FURTHER INFORMATION CONTACT".

This rule is a final order of the Administrator as defined by Section 1005 of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1485). As such, it is subject to review only by the courts of appeals of the United States or the United States Court of Appeals for the District of Columbia.

Special Federal Aviation Regulation 41C

Airworthiness Standards: Reciprocating and Turbopropeller-Powered Small Multiengine Airplanes: SFAR 41 Interim Standards

Adopted: July 21, 1982 **Effective: September 13, 1982**

(Published in 47 FR 35150, August 12, 1982)

SUMMARY: This amendment reinstates and extends the effectivity of Special Federal Aviation Regulation (SFAR) 41 which expired October 17, 1981, and amends the SFAR to: (1) Eliminate the 12,500-pound maximum zero fuel weight (MZFW) restriction; (2) limit the number of passenger seats to 19 for those small propeller-driven multiengine airplanes that operate at a certificated gross takeoff weight in excess of 12,500 pounds; and (3) relax the landing distance determination requirement, making it consistent with Parts 23 and 25. This amendment results from a number of petitions for exemption and rulemaking submitted to the FAA and provides economic benefits to commuter airlines by improving operating efficiency without compromising safety. This amendment does not address the possible codification of SFAR 41 into Part 23 as mentioned in Notice 82-3.

FOR FURTHER INFORMATION CONTACT:

Joseph Snitkoff. Certification Procedures and Standards Branch (AWS-130), Aircraft Engineering Division, Office of Airworthiness, Federal Aviation Administration, 800 Independence Ave., S.W., Washington, D.C. 20591, Telephone (202) 426-8395.

PLEMENTARY INFORMATION:

Background

A longstanding limitation, which distinguishes between large and small airplanes, requires all new type certificated airplanes with a maximum certificated takeoff weight of more than 12.500 pounds to meet the transport category airworthiness standards of Part 25 of the Federal Aviation Regulations, regardless of the type of operation or number of passenger seats. At the time this limitation was established in the regulations, there were a few small airplanes with maximum weights near 12,500 pounds. The International Civil Aviation Organization (ICAO) standards make a similar distinction.

SFAR 41 was adopted as an interim standard to permit limited growth and utilization of existing small propeller-driven multiengine airplanes that had demonstrated, through service experience, a satisfactory level of safety. These airplanes were made available to the emerging commuter airline industry consistent with the Airline Deregulation Act of 1978, without compromising the high safety standards in air transportation. SFAR 41 was designed to fill the gap between Part 23 and Part 25 certification standards until commuter airplanes could be developed and certificated to a set of standards more appropriate to their size and type of operation.

SFAR 41 prescribes additional airworthiness standards applicable to existing small propeller-driven multiengine airplanes. It allows, in part, type and airworthiness recertification of these airplanes at weights in excess of 12,500 pounds maximum certificated takeoff weight and with an increase in the number of passenger seats. A design restriction is imposed which limits the maximum zero fuel weight to 12,500 pounds.

The regulation was amended April 14. 1980 (SFAR 41A; 45 FR 25046), for clarification and to make editorial changes. It was further amended December 8, 1980 (SFAR 41B; 45 FR 80972), to specify additional requirements needed to comply with ICAO Annex 8 airworthiness standards. SFAR 41B expired October 17, 1981.

Notice of Proposed Rulemaking (NPRM) 82-3 to reinstate and amend SFAR 41 was published in the *Federal Register* on March 4, 1982 (47 FR 9360). The comment period closed on April 20, 1982. Comments received after the closing date were also considered in accordance with § 11.47(a).

Discussion of Comments

Twenty sets of comments were received concerning Notice 82-3 from many segments of the aviation community. Views of airplane manufacturers, owners, operators, pilots, foreign airplane manufacturers, foreign aviation authorities, and the flying public were received in response to the notice. In addition to the comments on Notice 82-3, one commenter's response to the related petition concerning landing distance determination also is disposed of in this change to SFAR 41.

Reinstatement of SFAR 41

Two commenters oppose reinstating SFAR 41. They maintain that SFAR 41, by virtue of its status as an interim standard, is deficient in many respects to Part 25 and therefore does not provide an equivalent level of safety to Part 25. They point out that SFAR 41 has lower performance standards and lacks comparable emergency evacuation, systems and equipment reliability and integrity, and fire protection requirements.

Regarding the contention that SFAR 41 is deficient compared to Part 25, the FAA wishes to point out that SFAR 41 was never intended as an equivalent to or a replacement for Part 25 with identical requirements. Rather, SFAR 41 was promulgated to enable greater utilization of existing Part 23 type airplanes for commuter operations when those airplanes are certificated to the higher standards of SFAR 41 even though they may not meet transport category certification requirements. The SFAR 41 standards incorporated additional airworthiness, crashworthiness, and airplane performance requirements designed to provide the necessary level of safety for a type of airplane that heretofore had not had such requirements specifically developed for it. Airplanes certificated under SFAR 41 have a good safety record. Extending the applicability of SFAR 41 for a limited period of time will benefit the commuter airplane industry and the flying public by improving service and operating efficiency with no derogation of safety. SFAR 41 was and will continue to be applicable only to small propeller-driven multiengine airplanes certificated before October 17, 1979, with a satisfactory service history at the time of application. This applicability date is not changed by this final rule; therefore, the proposal to reinstate the effectivity of SFAR 41 is adopted without substantive change.

Removal of the Maximum Zero Fuel Weight (MZFW) Restriction

Thirteen commenters support and one opposes removing the MZFW restriction. The opposing commenter proposes that instead of this, a maximum takeoff weight or a new MZFW limitation be established to control the large increases in weights for aircraft used in combined commuter/cargo operations which he predicts could result from removing the restriction. Such large weight increases, however, could not occur since there is a regulatory constraint on maximum payload of 7,500 pounds for commuter operations under Part 135 which, together with the 19-passenger limitation, effectively maintains aircraft weights at reasonable levels. Supporters of the proposal claim that removing the MZFW restriction is in the public interest as it increases the commuter airlines' profit potential and reduces operating costs without any adverse effect on safety. They assert that the MZFW is only a design consideration and should not be a limitation. Further, removing the restriction would permit the use of improved avionics equipment which, even though adding to the aircraft weight, would still result in economic benefits because of the greater payload allowed. Therefore, the proposal to eliminate the MZFW restriction is adopted without substantive change.

19-Passenger Limit

SFAR 41 through Amendment 41B contained no limitation on the number of passengers, but imposed a MZFW restriction of 12,500 pounds. Notice 82-3 made clear that, as a condition for eliminating the MZFW restriction, a specified passenger limit would be prescribed to preclude escalation of airplane size to the point where Part 25 standards would apply. As explained, a 19-passenger configuration was selected as the logical and economic limit to avoid the burden that would be imposed by flight attendant and possible other requirements for additional passengers. Eight commenters support the 19-passenger limitation and six commenters oppose it on the basis that a greater number be allowed. Those opposed believe that passenger capacities above 19 should be permitted as long as the airplane meets all applicable regulations, the safety level is not lowered, and there are some economic benefits to be gained. They point out that SFAR 41 to date does not contain constraints on the number of passengers except to define minimum aisle widths for 10 to 23 passengers and configurations with over 23 passengers, and specifies additional airworthiness standards for 16 to 23 passengers. Therefore, since SFAR 41 permitted applicants to request certification for more than 19 passengers, it is argued that the proposed limitation becomes arbitrarily restrictive in not allowing other manufacturers the same opportunity. Advocates of a higher passenger limitation also agree that the proposed limitation is artificial, that the additional emergency equipment that would be required is minimal, and that the number of emergency exits required for 16 to 23 passengers is the same. Three commenters support a 23-passenger limitation. None of these commenters, however, discuss the passenger limitation in the context of tradeoff for eliminating the MZFW.

When SFAR 41 was originally developed, both the FAA and the public involved in the rulemaking agreed that some constraint should be imposed to limit the number and size of airplanes designed to SFAR 41 standards. The "number" aspect was addressed by making SFAR 41 applicable only to airplanes type certificated before October 17, 1979. To limit the size, both an MZFW and passenger limit were discussed. At that time it was deemed most appropriate to utilize the MZFW as the means for controlling size. In today's economic environment, however, it is realized that this limit may impose undue hardship on SFAR 41 airplane operators and may even impede installing improved equipment. As recognized by some commenters, the FAA must now establish some other limiting criteria to prevent escalating SFAR 41 small airplanes into larger, pseudotransport-category types, and the 19-passenger limitation can effectively serve this purpose. Accordingly, the 19-passenger limitation is adopted without substantive change.

The FAA has reviewed all aircraft certificated (and existing applications for certification) under SFAR 41 and has found that all these airplanes involve no more than 19 passengers. Thus, imposing the 19-passenger limit will not adversely affect any existing application. Limiting the passenger configuration does not contradict the provisions of the Airline Deregulation Act in that it provides economic benefits for existing commuter and cargo operations without degrading safety.

Two commenters state that, if the 19-passenger limitation is adopted, reference to passengers in excess of 19 in the table of paragraph 5(e) (*k*) under *Doors and Exits* should be deleted. The FAA agrees and the table is amended to reflect the maximum passenger seating configuration of 19. Other changes proposed in Notice 82-3, consistent with the elimination of the MZFW restriction and adoption of the 19-passenger-seat configuration (proposals numbered 3, 4, 6, and 7), are adopted without change. No substantive comments beyond those previously discussed were made on these proposals.

Landing Distance Determination

Proposal 5 addresses the landing distance determination of SFAR 41 airplanes. It proposes to amend paragraph 5(c) (*a*) to relax the landing distance determination requirement to make it consistent with current Parts 23 and 25. In addition to comments expressing overall concurrence with Notice 82-3, six commenters specifically support the proposed change to paragraph 5(c) (*a*). Additionally, one of these commenters suggests two changes to Appendix A of Part 135. One change pertains to paragraph 6(a) (2) of Appendix A of Part 135 and would separate the go-around and landing cases or completely eliminate the $1.05V_{MC}$ requirement. The other change would realign paragraph 7(b) of Appendix A of Part 135 to relax the landing distance determination requirement in a manner similar to that proposed for SFAR 41, paragraph 5(c) (*a*). Neither of the changes suggested by the commenter are addressed at this time as revising Part 135 is beyond the scope of this rulemaking action.

However, the FAA does recognize that all applicants eligible for an amended or supplemental type certificate under SFAR 41 should be entitled to the benefits of the relaxed landing distance determination requirement proposed for paragraph 5(c) (*a*). Therefore, in addition to amending paragraph 5(c) (*a*) as proposed, which relaxes the requirement for aircraft certified under paragraph 1(b) of SFAR 41, identical relief is granted for aircraft certificated under paragraph 1(a) of SFAR 41 by amending paragraph 1(a) (2) to allow the 1.3V_{s1} gliding approach of the present § 23.75(a) or an alternative steady approach of a specified gradient.

One commenter disagrees with the proposal to relax the landing distance determination requirement of paragraph 5(c) (*a*) by allowing landing distances to be determined in accordance with § 23.75. The commenter cites the proliferation of operations under Part 135 with SFAR 41 airplanes and notes the importance and advantages of requiring the same high level of safety as provided under Part 121. The commenter cites the added safety factors in Part 121 of 1.67 and 1.43 for landing distances at destination and alternate airports, respectively.

The FAA agrees with the commenter's assertion with regard to the level of safety in landing distance determination for Parts 135 and 121 aircraft. This is exemplified by the fact that the 1.67 and 1.43 safety factors are required in both Parts 135 and 121. With the continued applicability of these identical landing safety factors and approach techniques, the same high level of safety will be maintained for landing distance determination with both SFAR 41/Part 135 and transport category/Part 121 airplanes.

By implementing the proposed change to SFAR 41, the landing distance would be determined using either a 1.3V_{s1} power approach or a 1.3V_{s1} gliding approach as specified currently in both §§ 23.75 and 25.125. If paragraph (*a*) under Section 5(c) of SFAR 41 remains unchanged, longer (and thus more conservative) landing distances would be specified for an airplane certificated under SFAR 41 than if that airplane were certificated under the existing Part 23 or Part 25. There is no justifiable reason for this inequity to exist. Because landing distances determined under SFAR 41 were overly conservative and since the landing safety factors are identical in Parts 135 and 121, the FAA cannot support the commenter's position. Therefore, the change to paragraph (*a*) under Section 5(c) is adopted as proposed and paragraph 1(a) (2) is similarly revised for consistency.

Miscellaneous Comments

Notice 82-3 proposed to extend the pre-existing production cutoff date by 2 years. Five commenters express support of the extension and cite the reasons given in the NPRM. One commenter misunderstood the proposal, believing the extension of the cutoff date to be only 1 year, and states that it should be related to the effective date of the amendment. The proposal to extend the production cutoff date from 1989 to 1991 is adopted without substantive change.

Proposal 8 extends the expiration date of SFAR 41C to 1 year after the effective date of this amendment. Five commenters specifically support this proposal and one commenter suggests that the expiration date be extended to 2 years. The FAA believes that 1 year affords sufficient time for manufacturers to apply for certification of their existing models with the MZFW restriction removed. Proposal 8 is adopted without substantive change.

One commenter proposes to delete the date "October 17, 1979" from paragraph 1(a) and 1(b) of SFAR 41 and to insert in its place "the effective date of this amendment." He states that under the proposed rule, an applicant having designed an airplane of this class after October 17, 1979, would be required to certify its airplane under Part 25 and would not be permitted certification under SFAR 41. The commenter feels it would be arbitrarily restrictive not to permit an applicant the opportunity to certify its airplane to SFAR 41 standards. The FAA considers this suggested change to be outside the scope of this rulemaking action.

Comments on Codification of SFAR 41 into Part 23

Notice 82-3 invited comments on the advisability of codifying the substance of SFAR 41B and the proposed SFAR 41C into Part 23, and to extend its applicability to new multiengine airplanes having a maximum takeoff gross weight greater than 12,500 pounds with 19 passenger seats. By its request, the FAA merely wished to accept preliminary comments on the advisability of changing Part 23, with the intent that any definite proposals would be included in future notices. Many interesting views and comments received on this issue are included in the docket file. In general, there is great interest in providing a viable regulation applicable to the certification of commuter airplanes. The FAA realizes that this issue needs careful study and review by all concerned, and it will be addressed in a separate notice.

Economic Impact and Benefits

Eliminating the MZFW restriction will have no adverse safety impact and may, in fact, improve safety because operators will be encouraged to add additional or improved avionics equipment. Aircraft operators will now be able to add more passenger seats, up to 19, increase baggage allowances, provide improved passenger amenities, and increase cargo capacity. Because the marginal cost of carrying the additional payload would be relatively low compared to the additional revenue for such carriage, the added utility of this payload increase could be significant.

A commuter carrier estimates that the proposed rule would permit an additional 1,500 pounds of cargo in its aircraft. At a cargo yield of 40 cents per pound, the carrier has the potential to increase its revenue by $936,000 per year. In addition, the carrier points out that there have been instances where it had been forced to refuse a shipment because of its weight. It also could increase the number of its passengers from 16 to 19 on one of its route segments.

It has been determined that the proposal to allow the use of shorter runways will not have an adverse impact upon safety. Economic benefits include the increased availability of air transportation to small cities that might otherwise be denied service because of short runways. For example, for a certain airplane the landing distance could be reduced from 5,171 feet to 4,100 feet. While difficult to measure in dollar terms, the benefits would be substantial, and because there would be no adverse impact on safety, the regulatory change will be in the public interest.

The airplane manufacturer will face some moderate costs in recertifying the airplane to the proposed new weight and landing distance criteria. An airplane manufacturer who does not wish to establish revised weight or landing distance limitations will not incur these costs.

Summary of Final Regulatory Flexibility Analysis

The Regulatory Flexibility Act requires an analysis of alternatives if a proposal has a significant economic impact on a substantial number of small entities.

The amendment to eliminate the MZFW restriction will have a significant positive impact on a substantial number of entities. The amendment is relaxatory in nature and a manufacturer may choose either to seek the benefits of the proposal or maintain the status quo. No further easing of the MZFW restriction is possible; therefore, there are no other alternatives to consider.

The amendment relating to the minimum landing distance determination will have a significant economic impact on a substantial number of small entities. There are no other relaxatory alternatives consistent with safety. Thus landing distance determination is needed to be consistent with longstanding §§ 23.75 and 25.125, the requirements of which have been proven by service experience and for which there is no safety basis to consider further relaxation.

If increasing the proposed 19-passenger limitation (for example, to 23 passengers) would improve the economic utility of a qualifying airplane as some commenters contend, this would not impact a substantial number of small entities and, therefore, need not be analyzed. The agency believes that without an MZFW restriction, there must be a passenger limitation to prevent these SFAR 41 airplanes which do not meet Part 25 standards from an uncontrolled increase in size. It is the FAA's judgment that airplanes carrying more than 19 passengers require different standards. The FAA will review Parts 23 and 25 as applicable to new commuter type airplanes and will give careful consideration to the issue of a passenger limitation.

The final Regulatory Flexibility Analysis and Regulatory Flexibility Determination are combined with the Regulatory Evaluation in the docket.

ADOPTION OF AMENDMENT

Accordingly Special Federal Aviation Regulation 41 (14 CFR Parts 21, 23, 36, 91, 121, 135, and 139) is amended effective September 13, 1982.

(Sec. 313(a), 601, 603, and 604 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424); Sec. 6(c), Department of Transportation Act (49 U.S.C. 1655(c)).)

NOTE: This amendment will allow manufacturers and operators of certain existing airplanes the option of complying with relaxed requirements that will increase payloads and improve air carrier services to the public. The FAA has determined that it involves a regulation which is not a major rule under Executive Order 12291 and is not a significant rule under the Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). A regulatory evaluation, including a final regulatory flexibility analysis, has been placed in the public docket. A copy of it may be obtained from the person identified under "FOR FURTHER INFORMATION CONTACT."

Special Federal Aviation Regulation 41

1. *Applicability.* (a) Contrary provisions of Parts 21 and 23 of the Federal Aviation Regulations notwithstanding, an applicant is entitled to an amended or supplemental type certificate in the normal category for a reciprocating or turbopropeller-powered multiengine small airplane originally type certificated prior to October 17, 1979, in accordance with Part 23 of the Federal Aviation Regulations in effect on March 31, 1971, or later, that is to be certificated with a passenger seating configuration, excluding pilot seats, of 10 seats or more (but not more than 19 seats) at a maximum certificated takeoff weight of 12,500 pounds or less, if the applicant complies with—

(1) The regulations incorporated in the type certificate; and

(2) The requirements of Appendix A of Part 135 of the Federal Aviation Regulations in effect on September 26, 1978 except that the landing distance must be determined for standard atmosphere at each weight, altitude, and wind within the operating limits established by the applicant in accordance with § 23.75(a) of this chapter in effect on September 26, 1978. Instead of a gliding approach specified in § 23.75(a), the landing may be preceded by a steady approach down to the 50-foot height at a gradient of descent not greater than 5.2 percent (3°) at a calibrated airspeed not less than $1.3V_{s1}$.

(b) Contrary provisions of Parts 1, 21, 23, 91, 121, and 135 of the Federal Aviation Regulations notwithstanding, an applicant is entitled to an amended or supplemental type certificate in the normal category for a reciprocating or turbopropeller powered multiengine airplane originally type certificated prior to October 17, 1979, that is to be certificated with a maximum takeoff weight in excess of 12,500 pounds, a specified maximum zero fuel weight to be established by the applicant, and, where requested by the applicant, an increase in passenger seating configuration, (but not more than 19 passenger seats) if the applicant complies with—

(1) The regulations incorporated in the type certificate;

(2) The requirements of Appendix A of Part 135 of the Federal Aviation Regulations in effect on September 26, 1978 with the exceptions specified in section 5 of this Special Federal Aviation Regulation; and

(3) The additional requirements specified in sections 7 through 14 of this Special Federal Aviation Regulation applicable to takeoff weights in excess of 12,500 pounds.

(c) Contrary provisions of Part 1 of the Federal Aviation Regulations notwithstanding, an airplane certificated under paragraph (b) of this section is considered to be a small airplane for purposes of Parts 21, 23, 36, 121, 135, and 139 of the Federal Aviation Regulations and a large airplane for purposes of Parts 61 and 91. Compliance with the small airplane provisions of Part 36 of the Federal Aviation Regulations must be shown at the maximum certificated takeoff weight approved under this Special Federal Aviation Regulation.

2. *Eligibility.* Any person may apply for a supplemental type certificate (or an amended type certificate in the case of a type certificate holder) under this Special Federal Aviation Regulation.

3. *Production limitation.* An amended or supplemental type certificate issued pursuant to section 1.(b) of this Special Federal Aviation Regulation is effective for the purpose of obtaining an original or an amended airworthiness

certificate, until October 17, 1991, unless the type certificate is sooner surrendered, suspended, revoked, or terminated.

4. *Restrictions.* For airplanes under section 1.(b) of this Special Federal Aviation Regulation—

(a) The maximum zero fuel weight of the airplane must be established as an operating limitation; and

(b) Except as provided in paragraph (c) of this section, the airworthiness certificate shall be endorsed "This airplane at weights in excess of 5,700 kg does not meet the airworthiness requirements of ICAO, as prescribed by Annex 8 of the Convention on International Civil Aviation."

(c) An applicant is entitled to type certificate amendment or a supplemental type certificate that shows compliance with ICAO Annex 8 if the airplane meets SFAR 41 and the following requirements prescribed by the Administrator in effect on October 17, 1979:

(1) At each weight, altitude, and temperature within the operational limits selected by the applicant—

(i) For approach climb performance, comply with §§ 25.121(d) and 25.1533(a) (2).

(ii) For takeoff performance, comply with §§ 25.105(d), 25.111, 25.113(a), and 25.115.

(2) For gust loads design at rough air gust speed V_B, comply with §§ 25.335(d), 25.341(a) (1), and 25.351(b).

(3) For smoke evacuation design, comply with § 25.831(d).

(4) For engine rotation and restarting design, comply with §§ 25.903(c) and (e).

(5) For engine cooling design, comply with § 25.1521(e).

5. *Exceptions.* For purposes of obtaining an amended or supplemental type certificate under section 1.(b) of this Special Federal Aviation Regulation, the following exceptions apply. All references in this section to specific sections of Parts 23 and 25 of this chapter are to those in effect on September 26, 1978 if no other date is given:

(a) Compliance with section 1 of Appendix A of Part 135 of the Federal Aviation Regulations is not required.

(b) Compliance may be shown with the applicable regulations incorporated in the type certificate in lieu of the requirements of Appendix A of Part 135 of the Federal Aviation Regulations for takeoff weights of 12,500 pounds or less, if the airplane was type certificated—

(1) Under FAR Part 23 in effect prior to Amendment 23-10 and the airplane is to be used only in FAR Part 91 operations;

(2) Before July 1, 1970, in the normal category with a passenger seating configuration, excluding any pilot seat, of 10 seats or more, (but not to exceed 19 passenger seats) and meets special conditions issued by the Administrator for airplanes intended for use in operations under FAR Part 135; or

(3) Before July 19, 1970, in the normal category with a passenger seating configuration, excluding any pilot seat, of 10 seats or more, (but not to exceed 19 passenger seats) and meets the additional airworthiness standards in Special Federal Aviation Regulation No. 23.

(c) In lieu of compliance with sections 7., and 19.(c) of Appendix A of Part 135 of the Federal Aviation Regulations, comply with the following at takeoff weights in excess of 12,500 pounds:

Landing.

(*a*) The landing distance must be determined for standard atmosphere at each weight, altitude, and wind within the operational limits established by the applicant in accordance with § 23.75(a) of this chapter. Instead of a gliding approach specified in § 23.75(a), the landing may be preceded by a steady approach down to the 50-foot height at a gradient of descent not greater than 5.2 percent (3°) at a calibrated airspeed not less than 1.3 V_{S1}.

(*b*) The landing distance data must include correction factors for not more than 50 percent of the nominal wind components along the landing path opposite to the direction of landing, and not less than 150 percent of the nominal wind components along the landing path in the direction of landing.

(d) In lieu of compliance with Section 28 of Appendix A of Part 135 of the Federal Aviation Regulations, comply with the following:

Fatigue evaluation of flight structure. Unless it is shown that the structure, operating stress levels, materials, and expected use are comparable from a fatigue standpoint to similar design which has had substantial satisfactory service experience, the strength, detail design, and the fabrication of those parts of the wing, wing carrythrough, vertical fin, horizontal stabilizer, and attaching structure whose failure would be catastropic must be evaluated under either—

(*a*) A fatigue strength investigation in which the structure is shown by analysis, tests, or both, to be able to withstand the replaced loads of variable magnitude expected in service. Analysis alone is acceptable only when it is conservative and applied to simple structures; or

(*b*) A fail-safe strength investigation in which it is shown by analysis, tests, or both, that catastrophic failure of the structure is not probable after fatigue, or obvious partial failure, of a principal structural element, and that the remaining structure is able to withstand a static ultimate load factor of 75 percent of the critical limit load factor at V_c. These loads must be multiplied by a factor of 1.15 unless the dynamic effects of failure under static load are otherwise considered.

(e) In lieu of compliance with section 32 of Appendix A of Part 135 of the Federal Aviation Regulations, comply with the following:

Doors and exits. The airplane must meet the requirements of §§ 23.783 and 23.807(a)(3), (b), and (c) of this chapter, and in addition the following requirements:

(*a*) Each cabin must have at least one easily accessible external door.

(*b*) There must be a means to lock and safeguard each external door against opening in flight (either inadvertently by persons or as a result of mechanical failure or failure of a single structural element). Each external door must be operable from both the inside and the outside, even though persons may be crowded against the door on the inside of the airplane. Inward opening doors may be used if there are means to prevent occupants from crowding against the door to an extent that would interfere with the opening of the door. The means of opening must be simple and obvious and must be arranged and marked so that it can be readily located and operated, even in darkness. Auxiliary locking devices may be used.

(*c*) Each external door must be reasonably free from jamming as a result of fuselage deformation in a minor crash.

(*d*) Each external door must be located where persons using it will not be endangered by the propellers when appropriate operating procedures are used.

(*e*) There must be a provision for direct visual inspection of the locking mechanism by crewmembers to determine whether external doors, for which the initial opening movement is outward (including passenger, crew, service, and cargo doors), are fully locked. In addition, there must be a visual means to signal to appropriate crewmembers when normally used external doors are closed and fully locked.

(*f*) Cargo and service doors not suitable for use as exits in an emergency need only meet paragraph (*e*) of section 5(e) of this regulation and be safeguarded against opening in flight as a result of mechanical failure or failure of a single structural element.

(*g*) The passenger entrance door must qualify as a floor level emergency exit. If an integral stair is installed at such a passenger entry door, the stair must be designed so that when subjected to the inertia forces specified in § 23.561 of this chapter, and following the collapse of one or more legs of the landing gear, it will not interfere to an extent that will reduce the effectiveness of emergency egress through the passenger entry door. Each additional required emergency exit except floor level exits must be located over the wing or must be provided with acceptable means to assist the occupants in descending to the ground. In addition to the passenger entrance door—

(*1*) For a total passenger seating capacity of 15 or less, an emergency exit, as defined in § 23.807(b) of this chapter, is required on each side of the cabin; and

(*2*) For a total passenger seating capacity of 16 through 19, three emergency exits, as defined in § 23.807(b) of this chapter, are required with one on the same side as the door and two on the side opposite the door.

(*h*) An evacuation demonstration must be conducted utilizing the maximum number of occupants for which certification is desired. It must be conducted under simulated night conditions utilizing only the emergency exits on the most critical side of the aircraft. The participants must be representative of average airline passengers with no prior practice or rehearsal for the demonstration. Evacuation must be completed within 90 seconds.

(*i*) Each emergency exit must be marked with the word "Exit" by a sign which has white letters 1 inch high on a red background 2 inches high, be self-illuminated or independently internally electrically illuminated, and have a minimum luminescence (brightness) of at least 160 microlamberts. The colors may be reversed if the passenger compartment illumination is essentially the same.

(*j*) Access to window type emergency exits may not be obstructed by seats or seat backs.

(*k*) The width of the main passenger aisle at any point between seats must equal or exceed the values in the following table:

Number of passenger seats	*Minimum main passenger aisle width*	
	Less than 25 inches from floor	*25 inches and more from floor*
10 through 19	9 inches	15 inches.

(f) In lieu of compliance with Section 45 of Appendix A of Part 135 of the Federal Aviation Regulations, comply with § 23.954 of this chapter.

(g) In lieu of compliance with Section 56 of Appendix A of Part 135 of the Federal Aviation Regulations, comply with the following: *Cowlings.* The airplane must be designed and constructed so that no fire originating in any engine compartment can enter, either through openings or by burn through), any other region where it would create additional hazards.

(h) In lieu of compliance with Section 57 of Appendix A of Part 135 of the Federal Aviation Regulations, comply with § 25.863 of this chapter.

6. *Additional requirements—general.* The additional requirements specified in sections 7 through 14 apply to the certification of airplanes pursuant to section 1.(b) of this Special Federal Aviation Regulation.

7. *Compartment interiors.* (a) If smoking is to be prohibited, there must be a placard so stating, and if smoking is to be allowed—

(1) There must be an adquate number of self-contained removable ashtrays; and

(2) Where the crew compartment is separated from the passenger compartment, there must be at least one sign (using either letters or symbols) notifying all passengers when smoking is prohibited. Signs which notify when smoking is prohibited must—

(i) Be legible to each passenger seated in the passenger cabin under all probable lighting conditions; and

(ii) When illuminated, be so constructed that the crew can turn them on and off.

(b) Each disposal receptacle for towels, paper, or waste must be fully enclosed and constructed of at least fire resistant materials, and must contain fires likely to occur in it under normal use. The ability of the disposal receptacle to contain those fires under all probable conditions of wear, misalignment, and ventilation expected in service must be demonstrated by test. A placard containing the legible words "No Cigarette Disposal" must be located on or near each disposal receptacle door.

(c) Lavatories must have "No Smoking" or "No Smoking in Lavatory" placards located conspicuously on each side of the entry door, and self-contained removable ashtrays located conspicuously on or near the entry side of each lavatory door, except that one ashtray may serve more than one lavatory door if it can be seen from the cabin side of each lavatory door served. The placards must have red letters at least one-half inch high on a white background at least one inch high. (A "No smoking" symbol may be included on the placard).

(d) There must be at least one hand fire extinguisher conveniently located in the pilot compartment.

(e) There must be at least one hand fire extinguisher conveniently located in the passenger compartment.

8. *Landing gear.* Comply with §§ 25.721(a)(2), (b), and (c) of this chapter in effect on September 26, 1978.

9. *Fuel system components crashworthiness.* Comply with §§ 25.963(d) and 25.994 of this chapter in effect on September 26, 1978.

10. *Shutoff means.* Comply with § 23.1189 of this chapter in effect on September 26, 1978.

11. *Fire detector and extinguishing systems.*

(a) *Fire detector systems.*

(1) There must be a means which ensures the prompt detection of a fire in an engine compartment.

(2) Each fire detector must be constructed and installed to withstand the vibration, inertia, and other loads to which it may be subjected in operation.

(3) No fire detector may be affected by any oil, water, other fluids, or fumes that might be present.

(4) There must be means to allow the crew to check, in flight, the function of each fire detector electric circuit.

(5) Wiring and other components of each fire detector system in an engine compartment must be at least fire resistant.

(b) *Fire extinguishing systems.*

(1) Except for combustor, turbine,,and tail pipe sections of turbine engine installations that contain lines or components carrying flammable fluids or gases for which it is shown that a fire originating in these sections can be controlled, there must be a fire extinguisher system serving each engine compartment.

(2) The fire extinguishing system, the quantity of the extinguishing agent, the rate of discharge, and the discharge distribution must be adequate to extinguish fires. An individual "one shot" system may be used.

(3) The fire-extinguishing system for a nacelle must be able to simultaneously protect each compartment of the nacelle for which protection is provided.

12. *Fire extinguishing agents.* Comply with § 25.1197 of this chapter in effect on September 26, 1978.

13. *Extinguishing agent containers.* Comply with § 25.1199 of this chapter in effect on September 26, 1978.

14. *Fire extinguishing system materials.* Comply with § 25.1201 of this chapter in effect on September 26, 1978.

Expiration. This Special Federal Aviation Regulation terminates on September 13, 1983, unless sooner rescinded or superseded.

*U.S. GOVERNMENT PRINTING OFFICE:1989-241-686:07042

UNITED STATES
GOVERNMENT PRINTING OFFICE
PUBLIC DOCUMENTS DEPARTMENT
Washington, D.C. 20402

Official Business

Postage and Fee Paid
U.S. Government Printing Office
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